

HANDBOOK FOR INDIAN CAVALRY.

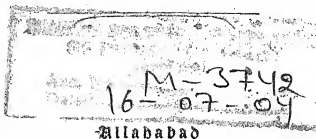


COMPILED BY

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9th Bengal Lancers.

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P R E F A C E.

My object in compiling this book has been to collect and arrange the accessible information on all subjects connected with the equipment, training and employment of Indian Cavalry, and endeavour to suggest a practical method by which an uniform system of instruction can be introduced. In addition to notes based on my personal experiences whilst Adjutant of my regiment under Colonel now Lieutenant-General Sir Power Palmer, K.C.B., and more recently as Brigade-Major to Major-General Grant, C.B., late Inspector-General of Cavalry in India, I have made extracts from and even in some cases have given the full text of Military works dealing with these subjects. I am very much indebted to the authors for allowing me to do so.

I am endeavouring to carry out this system of instruction in the Phulkian States' Imperial

Service Cavalry, as far as possible ; and shall thus have an opportunity of testing its practical value and noting its shortcomings.

My special thanks are due for the kind interest taken in this book by Major-General Elliot, C.B., D.S.O., the present Inspector-General of Cavalry in India, with whose approval I publish it.

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9TH BENGAL LANCERS,
Inspecting Officer, Phulkian States'
Imperial Service Cavalry

AMBALLA :
1st November 1898. }

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SECTION I.

SYSTEMS OF DRILL AND INTERIOR ECONOMY.

A FEW years ago the commanding officer looked
entirely to his adjutant for the
Old System. drill and general efficiency of the
regiment. The other officers, therefore, took a passive
interest in their work.

2. Since the adoption of the squadron system all this
has been knocked on the head, and
New System. a chain of responsibility in matters
of instruction as well as interior economy introduced.
The commanding officer now holds the four unit or
squadron commanders absolutely responsible for the
efficiency of the officers, men, horses and everything
connected with their squadrons. Whereas the adjutant
is entrusted only with the instruction of the recruits
and young horses, besides his office work.

3. The advantages of this system are not far to seek,
and can be summed up in the
Advantages of new fact that every officer and man
System. must now take an interest in and
thoroughly learn his work, as he has a certain task to
perform. This naturally gives the squadron commander
a thorough knowledge of the character and capabilities
of all ranks serving under him, whereby he can
be of great assistance to the commanding officer.

4. The following is the chain of responsibility in all matters of instruction as well as interior economy in a regiment which should become second nature to all ranks, and it must be remembered that to have a strong chain all its links must be strong :—

<p>The Chain of responsibility in a Regiment,</p> <p>The Commanding Officer.</p>	<p>The commanding officer must thoroughly examine his adjutant and squadron commanders, and keep them up to a high standard of efficiency at all times and allow them a free hand to do their own work.</p>
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<p>The Adjutant.</p>	<p>The adjutant has a most important position in the regiment. Besides his office and other duties he is responsible for the training of every recruit and young horse before they join the ranks. The value of this early training cannot be over-estimated, as on it depends the future of the regiment. In order to keep the riding-school staff thoroughly efficient and up to date, the adjutant must thoroughly instruct and constantly examine them. He is responsible also, that each half-squadron has one non-commissioned officer and one sowar proficient as drill instructors, and one non-commissioned officer and one sowar as rough riders, and more, if necessary. Their selection to be left to squadron commanders, but the adjutant should be allowed to take any man he has a fancy for. Recruits often show extraordinary aptitude as horsemen and instructors and should not be lost sight of. The younger the rough rider, provided he knows his work, the better; for he is, as a rule, lighter and his nerve is sure to be good.</p>
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Appointments to the riding-school staff should be considered a stepping-stone to promotion to both the commissioned and non-commissioned ranks, and liberal staff allowance given from regimental funds.

The wordi-major is the adjutant's right-hand man in all regimental work, so needless to say he must be a good man all round. As a rule, the training of recruits and remounts is not his strong point, and he is apt to get slack about it; so the adjutant must constantly examine him both theoretically and practically in the school and at the field. He should examine the chief drill instructor and chief rough rider constantly, and all the drill instructors and rough riders once a week mounted, to ensure uniformity of instruction and their being kept up to the mark in every way. (In some corps this is done on Thursdays in plain clothes which is a good plan.) He should receive the reports every morning from the chief drill instructor and chief rough rider and bring any serious irregularities to the notice of the adjutant.

The chief drill instructor is responsible for the riding-school in the absence of the wordi-major and adjutant. He should be the smartest and most promising non-commissioned officer in the regiment irrespective of age. Education and aptitude for imparting instruction being considered a *sine quâ non*. He must keep the drill instructors up to the mark, and is absolutely responsible to the adjutant for the training of all the recruits.

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The chief rough rider should be the next senior to the chief drill instructor, and like him should be a specially qualified man and an exceptionally good horseman in addition. He should perform the duties of the chief drill instructor during the latter's absence as regards supervision of the riding-school. He must keep the rough riders up to the mark, and is absolutely responsible to the adjutant for the training of all the remounts.

Drill Instructors. in the squadron and as young as possible. Their qualifications should be similar to those of the chief drill instructor.

Rough Riders. riders in the squadron and as young as possible. Their qualifications should be similar to those of the chief rough rider.

The squadron commander is responsible to the commanding officer for the drill and general efficiency of the officers, men and horses under him in every respect. He must, moreover, make himself so thoroughly acquainted with them, that the commanding officer can rely on him for all information concerning them. His first aim should be to endeavour to make his half-squadron commanders as proficient as possible.

The Half-Squadron Commander. The half-squadron commander, although an unnecessary link and one that does not exist in British (European) cavalry regiments, must be regarded as the commander of two troops of two sections each.

and therefore be held responsible by his squadron commander for their efficiency similarly as the squadron commander is held responsible for the squadron by the commanding officer. He must thoroughly instruct his jemadar and kote-duffadar in all their duties as troop commanders.

The troop commander has no administrative authority *per se*, but assists the half-squadron commander generally. The Troop Commander. He is responsible for the instruction and drill of his troop and should, therefore, very carefully train the non-commissioned officers in all their duties, more especially in imparting instruction.

The appointment of kote-duffadar should be considered a stepping-stone to promotion. The Kote-Duffadar. to the commissioned grade. Hence the necessity for appointing the most suitable non-commissioned officers in the regiment only.

In order to give the kote-duffadar every opportunity of instructing his troop, he should be relieved of as many duties as possible by an orderly duffadar told off specially from time to time.

The best all-round section commander in each half-squadron should be selected for the appointment of kote-duffadar, except under special circumstances.

The section commander commonly known as the "Toli Duffadar," is a most important man. He should command half his troop (a smaller subdivision does not always ensure the attendance of The Section Commander.

sufficient men for purposes of supervision or instruction), and must therefore be a specially selected man, irrespective of seniority, who not only the recruits but also the old soldiers can respect and be guided by. He must be a good instructor and know his work thoroughly, so that he can teach the men of his section, and, in case of necessity, be able to command his troop on parade.

5. Cavalry drill has been curtailed recently into one volume and no superfluous matter has been allowed to remain. The best principles and methods have been laid down for instruction, and it is the primary duty of all ranks to endeavour to obtain a practical knowledge of as much of the detail of these volumes as their respective positions require. It is but human to forget, and where so much detail has to be remembered as is now-a-days required by the cavalry soldier, constant reading of the drill-book is absolutely necessary. No officer or non-commissioned officer should attempt to instruct or superintend the instruction of men without absolute confidence in his knowledge of the subject, otherwise time will be wasted, mistakes slurred over, and the men will get into bad habits. A little reading or private instruction the previous day will often double the value of a parade. The higher the rank of the individual the more necessity there is for this; so that the commanding officer must be a constant reader and have such a thorough grasp of all details as will enable him to inspire confidence in others.

The cavalry drill-book contains all the information that is required from the lowest to the highest ranks of a cavalry soldier, *i.e.*, from a recruit to a divisional commander. Although it is very desirable for all ranks to read through it, it is quite impossible to expect the native ranks to retain more than is absolutely required for their respective duties. Hence it seems necessary to clearly define what all must read and learn thoroughly in order to carry out the chain of responsibility already described.

The following is recommended as a guide :—

Commanding Officer. The whole of the book to be studied, more specially all that refers to a single regiment.

The Adjutant ... The whole of the book, more specially Parts I and II.

The Wordi-Major... Besides learning his regimental duties in the field, he must make a special study of whatever refers to the training of recruits and remounts in the whole book.

The Chief Drill Instructor, and	{	Parts I and II, entirely.
The Chief Rough Rider.		Part III, up to "The Squadron."
	{	Part IV, up to "Advanced and Rear Guards."

Drill Instructor and
Rough Rider.

{ Drill instructors and rough riders have totally different duties to perform and should be kept separate. Experience proves that the less you give a native soldier to remember by heart the better so that drill instructors need remember in the words of the book only what is required for the instruction of recruits, and rough riders only what is necessary for training remounts. To begin with, they need only study the special requirements of the classes they are likely to be called upon to instruct at once.

Squadron Commander and Half-Squadron Commander.

{ Whatever refers to a single squadron, to be thoroughly learnt. The remainder carefully read.

Troop Commander.

Part I.

- {
- (a) The single ride.
 - (b) Post practice.
 - (c) Attack and defence drill.
 - (d) Mounted combat.
 - (e) Tent-pegging.
 - (f) Teaching horses to swim.

Troop Commander —(concl'd.)	{	Part II.
		(g) Marching.
		(h) Sword, lance, and carbine exercises.
	{	(i) Foot-parade of the regiment.
	{	Parts III, IV and V.
		Omitting "The Brigade" and "The Division," special study to be made of all the duties a troop or squadron may be called upon to perform.
Section Command- er.	{	Parts I and II, as for Troop Com- mander.
	{	Parts III and IV, as for Chief Drill Instructor and Chief Rough Rider.

6. To read and try to understand the drill-book is the first duty of all ranks. Then must follow theoretical and practical instruction in the subjects therein enumerated, carried out by the chain of responsibility. Theoretical instruction should be made progressive and precede all practical instruction. Finally, in order to ascertain whether all ranks are qualified for the various duties they may be called upon to perform, especially the most important ones necessitating the art of "writing," it has been found necessary

in the Phulkian States' Imperial Service Cavalry to establish some uniform system of Examination. The accompanying form gives details of the system in vogue, but the high standard therein laid down has been considerably lowered for the present, owing to the paucity of educated men in the ranks. Education, however, is fast spreading, and it is hoped in a few years that this standard will be attained by all ranks.

PERIODICAL EXAMINATIONS.

OBJECT.

- Show Officers and Non-Commissioned Officers exactly what subjects they must be proficient in at all times.
- Give all ranks opportunities of preparing themselves for similar examinations for promotion.
- Show the relative merits of different ranks and of different branches of the service.
- Show that all Officers and Non-Commissioned Officers are proficient.

Those not obtaining 50 per cent. of the aggregate number of marks being considered below the required standard of efficiency should be warned and re-examined at an early date.

As much notice as possible must be given and the date of Examination published in Regimental Orders in order that candidates may have time to prepare themselves and be thoroughly coached up by their instructors in all the subjects for examination beforehand.

SUBJECTS FOR ALL RANKS.

MAXIMUM MARKS.														Candidates.														REMARKS.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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Rank and Name of Examiner.														Rank.		Candidates.												Instruction of recruits.					Training of recruits.					Squad and Troop drill.					Skill-at-arms.					Squadron drill.					Regimental drill.					Detached and Guard duties.					General duties in conjunction with other arms.					Musketry.					Stable management.					Interior economy.					Method of imparting instruction.					Total.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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SPECIAL SUBJECTS FOR DRILL INSTRUCTORS AND ROUGH RIDERS.

MAXIMUM MARKS.				Exposition Part I.										Foot Drill, Vol. I, Part II.										REMARKS.	Excluded further ex- amination.	Excluded further ex- amination.
Rank and Name of Examiner	Candidates.	Rank.	Name.	10	25	20	40	20	10	45	45	15	20	25	35	25	60	10	15	15	15	50				
				Instruction of the recruit (Sec- tions 1 and 2).	Riding without saddles (Sec-tions 3 to 9).	Riding in saddles without stir- rups (Sections 10 to 14).	Riding with stirrups and life (Sections 15 to 17).	The single ride (Sections 18 to 20).	Riding with arms (Sections 21 to 27).	Training the young horse (Sec- tions 28 to 30).	Training horses which have al- ready been ridden (Secs. 31 to 33).	Leaping (Section 34).	Post practice (Sections 35 and 36).	Attack and defence drill (Sections 37 to 41).	Mounted combat (Secs. 42 to 45).	Tent-pegging, &c. (Section 46).	Troop drill (Secs. 47 to 17, Part III.	General rules and squad drill with intervals (Sections 1 to 6).	Marching (Sections 7 to 22).	Squadron drill in single rank at close files (Sections 23 to 29).	Troop drill (Sections 30 to 35).	Squad single stick lance and carbine exercises (Secs. 37 to 40).	Total.			
ADJUTANT. Resd. Unit Ali...	Duffadar (Drill In- structor).	Mardan Ali	1	20	15	30	20	10	...	...	15	15	20	25	25	50	10	10	10	15	40	340		
	Lee-Duffadar (Drill Instructor).	Sher Singh	10	20	10	20	15	10	...	...	10	10	15	20	20	30	10	10	10	10	30	260		
	Duffadar (Rough Rider).	Sant Singh	...	...	...	30	20	10	40	45	15	15	20	30	20	45	...	...	...	...	25	325	
	Sowar (Rough Rider).	Zalim Singh	...	...	...	20	15	10	65	40	10	10	10	20	20	35	...	...	...	...	25	250	

N.B.—Candidates are exempt from Examination in the subjects left blank opposite their names in both the above forms.

METHOD OF EXAMINATION.

The above forms not only give the subjects for examination, but also the maximum marks to be allotted to each as a general guide. The Commanding Officer must see both the written and *rend* questions for all theoretical examinations, and also the practical examinations, and give them to each Examiner when all the candidates have assembled. The Commanding Officer and Adjutant must be present during all examinations, and each Squadron Commander during his own Squadron examinations. Marks will be allotted by Examiners under the supervision of the Commanding Officer, who will ensure justice being done. Practical examinations will be similarly conducted.

It is laid down as a general principle that theoretical instruction must precede all practical instruction, so examinations must follow the same rule and be divided into—

- Theoretical examinations.
- Practical examinations.

Theoretical examinations should be carried out during the summer. The second furlough men being examined before they go, and the first furlough men as soon after they return as convenient. The examination to be held on two consecutive days, Sunday indoors, and consist of—

- 100 Written questions. Five (5) marks for each.
- 100 Written questions. Ten (10) marks for each.

For every 25 marks allotted to a subject, one written and three *rend* questions will be given a candidate, for less in proportion.

Practical examinations should be held during the drill season. The Commanding Officer must arrange so as to have the first examination carried out during the week after the annual Squadron muster has been completed, if possible. The knowledge of candidates must be practically tested by placing them in command of the regiment, squadron, troop, or squad according to rank, and by *rend* questions. For every 25 marks allotted to a subject, 15 marks should be given for practical work and 10 for each *rend* question for less in proportion.

RESULT OF EXAMINATION.

After each of the theoretical and practical examinations the result will be reported in a "confidential" book to be kept for the purpose in the Adjutant's Office.

7. The instruction of cavalry embraces so many subjects, that it should be carried out systematically throughout the year. In India the weather is so hot and trying from 15th April to 15th October, that it is impossible to do much work with due regard to the health and condition of men and horses. Hence the necessity for considering what subjects can be safely taught during these months and what left for the regular drill season. I think they may be divided as follows:—

SUMMER COURSE.

Equitation.

Training of equitation instructors.

Foot-drill.

Guard and sentry duties.

Sword, lance, and carbine exercises.

Post practices.

Attack and defence drill.

Mounted combat.

Tent-pegging and lime-cutting.

Teaching horses to swim.

Entraining and detraining of men, horses, and baggage on field service scale.

Dismounted service.

Musketry drills.

Instruction in detached duties.

Detached duties (outposts and advanced and rear-guards).

WINTER COURSE.

1st Period.—15th October to 30th November.

Riding drill combined with practice of pace and post practices from 15th to 31st October.

Squadron training from 1st November to 30th November, including one commanding officer's parade a week, if necessary.

2nd Period.—1st December to 31st January.

Regimental drill including one whole day a week for manœuvre in the country. Annual lance and sword competitions to be held. Annual course of pistol practice to be executed.

3rd Period.—1st February to 15th March.

Manœuvre combined with brigade and other drills. Annual long reconnaissance, chart and compass competition and field firing to be done.

4th Period.—16th March to 15th April.

Musketry.—Preliminary drills followed by annual course from 1st April.

N.B.—The date of the annual inspection of the Inspector-General of Cavalry (*vide* Programme, page 524 *et seq.*) might necessitate some changes in the above periods of instruction.

8. From the above it will be seen that the subjects

Subjects for Instruction.

laid down for the Summer Course are those requiring a good deal of individual attention for which time cannot be spared during the Winter Course which has to be devoted chiefly to drill and manœuvre. Riding School and Musketry drills, however, must be continued throughout the year except during squadron training.

Recruits on enlistment should be put through their course of Musketry training and an elementary course.

of Gymnastics. They should be taught the following parts of the drill-book :—

Equitation, Part I, up to Section 38.

Foot Drill, Part II, „ „ 40 (Omitting Section 38 “Single stick.”)

Drill, Part III, „ „ 17.

Foot Drill and Equitation.

Part II, Sections 1 to 32, should be taught during instruction in “Riding without saddles” and “Riding in saddles without stirrups” (Part I, Sections 3 to 14), while Sections 33 to 37 and 39 to 40 should be taught during “Riding with stirrups and bit” and “The Single Ride” (Part I, Sections 15 to 23).

This part of the training should also include the following :—

- (a) Troop drill on foot as a preliminary instruction for troop drill mounted.
- (b) Attack and defence drill on foot.
- (c) Guard duties.

Drill.

As soon as recruits are promoted into the “first class” in Riding School and have been passed by the Adjutant as proficient in the above subjects, they should receive instruction in the following, which will form part of their final examination by the Commanding Officer :—

- (a) Troop drill.
- (b) Post practice.
- (c) Mounted combat.

(d) Lance and sword tent-pegging.

(e) Lime and sheep cutting.

N.B.—Squadron commanders will generally be only too thankful to complete convenient sized squads for the above practices, from their stupid men or those under punishment for inattention on parade, if required by the Adjutant.

In the training of remounts it is the greatest possible advantage to keep the same man on the young horse when once started training, the owner if possible.

If, however, the adjutant considers the owner is not a sufficiently good horseman he should ask the squadron commander to substitute the best man he can. The former, in return, should relieve the latter of other duty in the lines.

Before a horse can be considered fit to join the ranks, the following must have been learnt :—

- (1) Marching straight to the front.
- (2) Leaving the ranks at all paces, also reining back individually out of the ranks.
- (3) Passaging and reining back as an entire rank.
- (4) Attack and defence drill.
- (5) Lance and sword post practices.
- (6) Troop drill at all paces. At first increased interval should be taken, otherwise a nervous horse will jostle and upset the horses on each side of him. Steady horses should be selected for the flanks.
- (7) Dismounted work, standing fire, and being led at all paces in a dismounted section, require special attention.
- (8) Charging in line compactly, breaking up, and rallying.

(9) Jumping over the regimental jumps.

N.B.—Squadron commanders should be asked to complete convenient sized squads for the above practices from their steady old horses.

Von Schmidt, as indeed all cavalry writers, is very strong upon the necessity for thorough training of remounts, and says, "Too much pains cannot be taken in training remounts, for on them the progress and efficiency of the squadron depend. The better the young horses are trained the longer will they last, the better horses will the squadron have for training recruits and so much the better and more quickly will the young soldier learn. The test of successful training is that all horses will be effective, none lame, all clean in the limbs, all free from blemish, all well placed, necks bent, jaws drawn back; the paces will be even, light and free. This standard in the state of the horses, must be the very first consideration." Indian Cavalry regiments have no reserve of horses, so that commanding officers are obliged to get their remounts into the ranks earlier than they consider desirable in order to keep their regiments up to field service strength. Moreover, they are obliged to buy so many immature horses at Fairs, which further handicaps them. So that it is quite impossible to expect remounts to be made into "Machines" *before* they join the ranks, but there is no reason why they should not *after*.

When the adjutant brings up recruits and remounts for dismissal by the commanding officer, squadron commanders ought to be present to point out any they do not consider fully trained, otherwise they will have trouble later.

If the principle of *every lesson* showing *some* improvement is fully acted up to in the Riding-school, recruits should join the ranks within 12 months and country-bred remounts in half that time (walers take longer to train).

Trumpeters, pioneers, and signallers require not only to be thoroughly instructed, but constantly practised.

9. All officers on joining, and non-commissioned officers on promotion, should be thoroughly instructed in giving words of command and imparting instruction. Practice of officers and non-commissioned officers in imparting instruction is of vital importance and a practice that has been much neglected up to date. It should precede all instruction given by them. At first the officers and non-commissioned officers should be separated in squads. The instruction might begin with communicating drill, two officers and non-commissioned officers being called out in front of the others, and in their hearing ordered to examine each other alternately in such subjects as the superintending officer or instructor may direct, taking care to correct all mistakes made. This will engender confidence, and both officers and non-commissioned officers will soon learn how to instruct squads, then troops and squadrons as required, both dismounted and mounted. Commanding officers should frequently give the 2nd-in-command and squadron leaders a regimental drill or field day, all senior officers being relieved from attendance. This if carried low enough exercises all the junior ranks in superior commands, and is an excellent service practice.

SECTION II.

NOTES ON SUMMER COURSE.

EQUITATION.

10. Recruits and remounts should be divided into classes, and not rides, as under.
Recruits and Remounts to be divided into classes, not rides. It is immaterial how many rides there are in each class.

11. A register should be kept by the chief drill instructor and chief rough rider respectively, to show the daily attendance of recruits and remounts and the number of lessons given them in each class as a check on the time taken for instruction, which should not exceed 200 lessons for first class recruits and 100 for first class remounts or, roughly, 9 months for the former and half that time for the latter, if time is not wasted. No recruit or remount, however, should be "dismissed" until absolutely proficient, *vide* page 15 *et seq.*

Classification of Recruits.

12. Class IV.—On blankets.

Class III.—Saddles and bridoons. Spurs to be given when sufficiently advanced.

Class II.—Bits and spurs and up to full arms.

Class I.—Fully equipped and being trained at the field, returning to riding-school one day in the week.

13. Recruits in classes IV and III should jump daily in the enclosed school. The former without the assistance of reins and the latter with crossed stirrups, occasionally, to give them confidence and a firm grip.

Class II should go over the open recruits' jumps both singly with "trailed" lances and in line with "carried" lances every other day. In the former case the recruits should be called out by name hap-hazard and their horses not allowed to shift about.

Class I should go over the regimental jumps as above.

14. Class IV.—Horses under four years old to go to riding-school twice a week with blankets and bridoons with the object of being handled, gently mouthed and taught to walk only. Rough riders will thus get an opportunity of knowing these horses before they begin their regular training; which, however, should be postponed as long as they can be spared, and not before $4\frac{1}{2}$ years of age if possible.

Class III.—Bridoons. Spurs to be given when sufficiently advanced.

Class II.—Bits and up to full arms.

Class I.—Fully equipped and being trained at the field, returning to riding-school one day in the week.

15. Remounts (except class IV) should be jumped every other day. Class III in the enclosed school. Class II over the open recruits' jumps and Class I over the regimental jumps similarly as the recruits.

16. The following dimensions are best suited for jumps which should be made, if possible, broad enough to admit of at least a troop going over in line rank entire. Larger ones shake the confidence of men and horses:—

Height, such as a hedge, walls, rails, etc., from $2\frac{1}{2}$ to 3 feet.

Breadth, such as a wet or dry ditch, with sloping banks, brook, etc., from 2 to 7 feet wide.

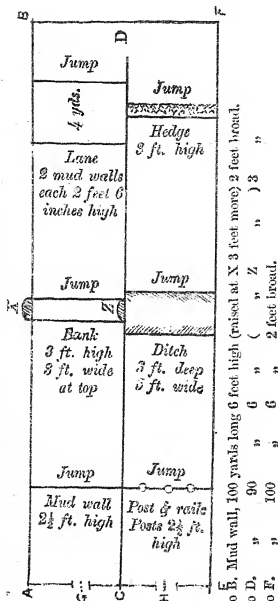
Banks, on and off, not more than $4\frac{1}{2}$ feet high 6 feet broad, with a ditch on each side from 2 to 3 feet wide, and not more than 2 feet deep.

The bigger a bank the safer; horses if at all impetuous, try to fly the lot in "once." If they are trained over a bank they cannot possibly compass, they will learn to negotiate all banks in "twice" which is what is required. The Irish colts and fillies are lunged over big banks first and then narrow banks after. To make a good bold and safe bank jumper, a horse should be educated to expect a ditch on both sides and should "deliver himself" collected ready for any emergency on the far side. Once trained on these lines he will never fall and will learn to use his intelligence at each fence he crosses. A horse should change legs on a bank always. He will do this naturally if properly schooled with long reins first and given time, his first few days on the longe (*i.e.*, long reins).

Native cavalry regiments, as a rule, have a small circular enclosed jumping-school for recruits and remounts. The accompanying plan of an enclosed school is preferable as not only can recruits and remounts be taught to go straight over jumps freely and correctly, but the

M3942

Plan of enclosed Jumping School.



N.B.—The above are the inside dimensions, i.e., not including thickness of wall. Walls one foot of brick,

horses of the whole regiment can be exercised by being driven over and back if desired, four horses or less at a time, bare-backed and with snaffles only. Needless to say they should never be struck, but merely driven by the crack of a long whip at first, and it will be found that after a short time they will go round by themselves. If desired, the jumps can be enlarged temporarily for the regiment.

17. Recruits and remounts should always jump by single file to begin with. The
 Instruction in Jump- instructor calling out men by
 ing. names, but not in order. If the
 horses begin shifting about, he should stop all future business till they get steady again. If the men understand this, the horses will. Horses should be pressed into a hand gallop about four horses' length before a jump and be steadied gradually to a trot the same distance after a jump. Horses should be taught to go over the series of jumps in a straight bee-line and not on any account be allowed to swerve or jump side-ways. They should, as a rule, be ridden on all four reins, and reins should be sufficiently long so as not to jerk their mouths on landing. If a horse chucks his head on landing, it means either too short reins or too severe a bit. It is the fear of receiving a chuck in the mouth on landing which causes horses to rush up to a jump, then stop dead and, finally, buck over. More leg-pressure and longer reins will teach a horse to jump smoothly and steadily. When recruits fall off in nine cases out of ten it is, because their reins are too short and they are pulled out of the saddle by the shortness of the reins when the horse stretches his neck on landing.

18. The following are the faults usually found in riding-school and must be specially guarded against :—

(1) Instructors do not know sufficient about the recruits and remounts they are instructing. This is sometimes due to their being constantly changed, which is fatal.

(2) Recruits' uniform and accoutrements are often not clean and smart. Their saddlery and also that of remounts is often carelessly fitted, more especially the bits and curb chains. The former being frequently too high up and the latter not flat in the curb groove with the requisite amount of play, *i.e.*, 45° for ordinary and not less than 30° for pulling horses, with the direction of the cheek pieces.

(3) Horses are badly groomed and their manes and tails not dressed.

(4) Instructors do not understand that every lesson should show some improvement.

(5) The rules of dressing at the halt are often neglected.

(6) Recruits' positions and the length of their stirrups are not sufficiently checked. Legs are often too far forward, and when in the correct position they are generally not steady enough from the knee downwards. The spur is seldom properly applied, bridle arm not close to the side and the small of the back not kept in.

(7) The lance is not held perpendicularly with the back of the hand to the front, the thumb in line with the point of the shoulder and the elbow down.

(8) Horses are not ridden up to their bits by pressure of the legs, and reins constantly get slack and no notice is taken, so that the horses do not hold their heads in the correct position, *i.e.*, so that the rider can see the horse's inward eye and the forehead and nose of the horse are nearly up and down in a perpendicular and the boss of the bit in line with the top of the wither.

(9) Instructors do not speak with authority, and give words of command like parrots instead of explaining quietly and distinctly what is required. They do not see that the simplest things are correctly done, such as—

- (a) riding horses into the corners;
- (b) turning on the markers (and not circling);
- (c) going straight across the school (and not inclining);
- (d) covering correctly;
- (e) the rear of the ride keeping on the track of the leader.

And in the "bending" lesson—

- (1) during the early lessons the instructor does not stand and correct the position of each horse as it passes, returning it to the rear if incorrect;
- (2) the aids for the turns at the corners, both on the forehand and haunches, should be so applied as to prevent the slightest reining back.

N.B.—It is a mistake to teach young horses to go into the corners or make square turns accurately until they are strong enough and their ribs have been well supplied by training.

(10) Instructors often blame the whole ride for a mistake, instead of the responsible individual by name.

(11) Rides are not sufficiently often dismounted to ease the horses and to examine the riders in what they are being taught.

(12) Progress of recruits and remounts too slow. This often happens because the promising ones are kept back for the backward ones, instead of being pushed on.

(13) Reins not lengthened for jumping which causes the horse to chuck his head and thereby unsteady the rider.

The lengthening of the rein to give a sufficient scope to spread himself is best attained by raising the hand forward at the right moment. (This of course requires time and practice: some men never attain it and can only keep their seats at the expense of the horses' mouths.) If you give a horse extra rein, and he makes a bad peck, you can't help him to recover; and if he endeavours to run away on landing and you have too much rope out, he may either hurt himself or get the trick of it. The art of sitting a horse at a fence is to have enough rein out for him to spread, and at the same time short enough to be under perfect control in either of the above situations remarked on.

(14) Horses are not ridden in a straight line over jumps, but allowed to jump wherever they like.

(15) Pace is very irregular from want of sufficient instruction over the measured distance during the first lessons, when both recruit and young horse must be taught to "feel" the pace.

(16) Communicating drill not practised sufficiently by advanced recruits.

19. All officers and non-commissioned officers of the rank of duffadar should be able to drill a ride. They should be ordered to attend riding-school until they are passed by the adjutant; but once passed their squadron commanders will be responsible for keeping them up to the mark.

Training of Equitation Instructors.

20. The native cavalry soldier seems to think he is not required to march on foot and, as a rule, cuts a very poor figure when he does. Needless to say that this idea is a very erroneous one and should be very much deprecated. Nothing is so subversive of discipline as to allow any slackness on foot. An occasional foot-parade is absolutely necessary; and marching, changing of direction and simple formations with utmost steadiness should be insisted on. The first and the most difficult thing to teach a native soldier is to stand still, and to look to his front only while at attention.

Foot Drill.

21. All non-commissioned officers (especially the recently promoted) and men should be examined periodically in these duties. Too great stress cannot be laid on their importance in peace time as a training for war. It should be remembered that a regiment with a reputation for having smart and alert guards is not only welcomed in every camp, but invariably inspires all with confidence by its discipline.

Guard and Sentry Duties.

22. The cavalry soldier should look to his sword and lance to fight with and his carbine to defend himself with, except under exceptional circumstances. His early training should be so good that he can never forget the best methods of using his weapons, but constant practice is absolutely necessary for the hand and eye to work together.

23. Every officer and man armed with a sword only should be instructed in this excellent practice and passed in "loose play."

Single Stick Practice.

24. Sword post practice for a Sabre regiment and lance post practice for a Lancer regiment. These practices require a deal of training and are a good test of horsemanship and skill-at-arms. To begin with, the horses should be walked, then trotted and cantered through the posts and no attempt made to use weapons until they leave the ranks properly and go very smoothly and steadily through the posts. Cuts should be made with the edge of the sword leading and thrusts with a straight arm, etc.

Sword Post Practices.

25. This is a most excellent practice and makes both men and horses bold. Great care must be taken with timid horses and no attempt made to use weapons until they will face each other fearlessly at all paces. Instead of making a whole ride repeat a movement for the benefit of one or two awkward men or horses, it is better to let the latter only repeat it as

Attack and Defence Drill.

often as necessary, or remove them by themselves. Special attention must be paid to see that the men use their weapons properly.

When attack and defence drill is sufficiently advanced, the following practice is recommended, *viz.*, place some posts with straw heads (representing a man standing) together with stuffed dummies on the ground over a convenient area dividing the rides. Then send out men singly, in twos or threes from each ride, to attack the dummies; in doing so they should be ordered to cross each other, which will make them ride their horses as well as use their weapons.

26. Mounted combat, of course, is the fighting test

of a cavalry soldier for which the
Mounted Combat. exercise mentioned above should

have prepared him and his horse. The rules for carrying out the annual Lance and Sword competitions are given in page 541 *et seq.* There is a tendency in mounted combats to engage the files invariably on the same rein and to give the same length of attack. To induce the use of alternate thrusts, guards and points in lance and sword play, it will be found good practice to vary the conditions under which the files engage, *i.e.* :—

1st Assault.—“Files, eyes right,” “attack from centre markers.”

2nd Assault.—“Files, eyes left,” “attack from centre markers.”

3rd Assault.—Circle. The whole breadth of school and opposite centre of it.

4th Assault.—Circle. "Files about" "Attack" simultaneously. (Excellent test for breaking of horses and quickness of files in getting to work.)

The above four attacks from the left rein.

This gives eight different methods of bringing the files together for "short attacks."

To test courage of horses and men also use the "long attacks," i.e., from centre, ends or corners of school or $\frac{3}{4}$ markers, on either right or left rein.

Again, in long attacks allow files to pass and give the word "About," "Attack," when each file is at the $\frac{3}{4}$ length of school.

This tests riding and horsemanship—first man round can choose rein to attack on.

It is very easy to arrive at the value of either a swordsman or lancer if put through all the above.

27. The use of the long lance with heavy point and light butt is of no use in training the Lancer, whereas if the men use for tent-pegging their regimental lances, they are perfecting themselves in the use of a weapon they will use in the field. The advantages of using a regimental lance, are :—

Tent-pegging, Lime
and Sheep Cutting.

- (1) It makes commanding officers keep their lances of a handy length and weight. Some corps have lances that, to use efficiently, you require a 12-stone man, and are more like "Hop-poles" than a weapon for killing a man with quickly and efficiently.

(2) No rotten lance shafts can be in use as the men test them periodically; if weak, they break at once.

(3) You are making men more proficient in the use of their service weapon, and the tent-pegging is of real value to corps.

The best system of carrying out lance and sword, tent-pegging practice is given on page 548 *et seq.*

In lime or sheep-cutting the instructions for the use of the sword mounted contained on page 551 *et seq.* should be borne in mind.

28. The report sent by the General Officer Commanding Peshawar District to the Adjutant-General in India on the swimming instruction carried out by the 9th Bengal Lancers at Peshawar in 1893, and "Skobelev's orders in 1882 to cavalry for crossing rivers," circulated with Adjutant-General's No. 2641 of the 24th July 1892, *vide* page 478 *et seq.*, will both be found most useful guides.

29. A drill written for entraining and detraining men, horses and baggage on field service scale by Captain Fasken, 10th Bengal Lancers, will be found very useful, *vide* page 501 *et seq.*

30. Not enough instruction is usually given in this important duty. The following remarks on the subject from General Von Rosenberg's little book, will show what the idea on musketry efficiency in Germany is. The notion that cavalry will lose its faith in the charge if

much attention be paid to shooting, is, he says, absurd; and he adds: "If any commander (be he squadron commander or general) fails to take advantage of a favourable opportunity for charging, simply because his troops are armed with the carbine, we may be quite sure that he would have equally missed his chance, supposing he had not had a firearm."

As to there being any difference between the instruction of cavalry and infantry in musketry, he says there is none except in the number of cartridges to be fired. "Indeed, in the matter of fire discipline, judging distance and making use of ground, cavalry are equally efficient as infantry, while the moral effect produced by the fire of either will have the same result upon an enemy." The tactical employment, however, of the firearm is quite different for the cavalry. "We should always shoot at considerable ranges and from a safe position, and only so long as the enemy make no signs of attacking us seriously. The moment this becomes apparent we must rapidly mount and disappear only to recommence the fire at some other spot further off. The attack of a position is entirely outside the duties of cavalry, just as much as is the employment 'arme blanche' on foot."

Leading horses at the various paces in dismounted service requires constant practice. Squadron commanders should be careful that their remounts have been thoroughly trained in this important duty before dismissal from riding-school.

In dismounting "by sections" much time will be saved if the men take their lances as well as their carbines with them. They will, moreover, have a very

effective weapon at hand to defend themselves with if suddenly rushed.

31. Even after the annual course has been completed, firing exercise, aiming and fire control drills should be carried out once a week regularly and judging-distance drills twice a month.

32. Instruction in pistol practice is much neglected, as a rule, although of vital importance. The firing exercise should be thoroughly learnt by all ranks armed with a pistol, and their horses trained to stand fire, for which the following method with blank ammunition is recommended to begin with, *viz.*, place four targets for pistol practice and form up the mounted men of each troop in line opposite to the targets, but facing to the left, at the usual distance, namely, 30 paces. Give the men on the flanks strict orders to keep on their outward legs tight so as to prevent the horses from being able to shift about. The right-hand man of each troop should then begin to fire at the target, the remainder keeping as steady as possible. When he has finished he reins back and re-forms on the left, the remainder closing to the right. The next man on the right then fires at the proper distance, and so on, until they have all finished firing with the right hand. The men then practise firing with the left hand in a similar manner. The above practice is for a squadron, but a whole regiment can be similarly exercised at the same time by placing the men of each squadron opposite a target.

Horses must be gradually trained or they will get spoilt. When they have begun to stand steadily as

above, half the number of men can be placed opposite each target, then two or three, and finally single men. Great care must be taken never to fire over a horse's head or ears, or punish him in any way. With a wild or excitable horse start by firing to right rear, then by degrees to half-front.

33. In native cavalry regiments very few native officers and non-commissioned officers are sufficiently educated to make even rough sketches. There is no reason why those who are should not be thoroughly instructed, and the majority taught to read maps and find their way about the country by the aid of them. Classes of instruction of eight or ten men should therefore be formed by squadron commanders. A pamphlet, entitled "Reconnaissance Course for Cavalry Soldiers," by Lieutenant-Colonel J. E. Nixon, will be found most useful for this purpose, *vide* page 554. Squadron commanders should further carry out the training laid down in Cavalry Drill, Part V, Section 8, during the Summer Course, as much as possible, as there is little spare time during the drill season.

Special instruction must be given in conveying verbal reports and writing concise and clear ones, omitting nothing of importance and avoiding superfluous matter, *vide* Cavalry Drill, Part IV, Section 5, and orders for Chart and Compass Competition, page 569.

The valuable system of instructing "Scouts" recommended by Colonel Baden-Powell, 5th Dragoon Guards, *vide* page 562 *et seq.*, should be adopted as far as possible.


34. The maps generally supplied by District Staff
Maps. Offices puzzle the native ranks
very much, as the names of vil-
lages given are often not commonly known as such by
country folk. The map of the country, 12 miles or
more round each station, should therefore be carefully
checked, and the native name of each village written
in vernacular in one or more characters, if necessary,
near the English. I have recently had similar maps of
Patiala, Jhind and Nabha and adjacent country litho-
graphed and mounted on cloth, each map squared, num-
bered, and lettered in the usual way, but made to fold
into a thin pocket-book like an ordinary tourist map.
They have been found very convenient to carry, easy to
refer to, and most serviceable.

The "Pioneer" Press, Allahabad, made up these maps,
according to instructions I sent, for about one rupee
each for a large order.

35. Although improving, native officers and non-com-
missioned officers rarely make an
Watches, Compasses intelligent use of their watches,
and Field Glasses. compasses, and field-glasses. In
fact, the last named are useless except in the hands of a
very few. Special instruction is therefore necessary.

As regards watches I have found an open-faced watch,
named the "Champion Railway," procurable for Rs.28
from the West End Watch Company, Calcutta, most
serviceable.

The "Colonial" (small size) and "Sandhurst" com-
passes procurable from Messrs. Lawrence and Mayo,



Opticians, Calcutta, for Rs.10 and Rs.5 respectively, are well suited for officers and non-commissioned officers.

The "Colonial" has a double case, but the "Sandhurst" is open-faced. Both are quickly set and the bearings are clearly marked in degrees which natives can easily read and follow.

The bronze hunter magnetic compass with vernacular dial, price Rs.6-8-0, designed by Captain Andrew, 1st Lancers, Hyderabad Contingent, will be found most suitable for native officers and non-commissioned officers who are unacquainted with the symbols on the English compass.

36. Open-faced watches and compasses are best protected by transparent horn-cases procurable in most bazaars for a few annas each.

Cases for Open-faced
Watches and Compasses.

37. In every squadron there should be two non-commissioned officers (one duffadar and one lance-duffadar) especially enlisted, if necessary, with a good knowledge of English and Vernacular, who must be thoroughly trained in detached duties so as to be able to accompany their squadron commander in the field with the object of keeping a diary, reading the map and writing reports in English or Vernacular (for his signature) as they may be ordered. This assistance will be invaluable to all squadron commanders, especially illiterate native

Squadron Writers.

officers ; for, it is often very difficult for any squadron commander to write in the field, as his attention is generally required elsewhere.

Each squadron commander will, moreover, thus have two "school masters" of his own, who by private tuition ought to be able to produce better results than a regimental school, which is never popular with native soldiers.

38. Outposts, advanced and rear-guards should be

Detached Duties.

practised in conjunction with the instruction in detached duties abovementioned. Outposts by night should be practised, and each practice based on a definite supposition and object, as far as possible, under the conditions of actual warfare. An enemy should invariably be represented.

SECTION III.

NOTES ON WINTER COURSE.

1st Period.

39. In order to have a good regiment the first thing to do is to see that the leaders are properly trained and mounted. The commanding officer should, therefore, inspect all the officers and non-commissioned officers at riding drill, paces, and post practices as soon as the drill

Annual preliminary
inspection of Officers
and Non-Commissioned
Officers by Commanding
Officer.

season begins ; to satisfy himself that they are suitably mounted on well broken horses, are good riders and judges of pace, and know how to use their weapons. Few commanding officers are sufficiently careful about the mounting of their officers and non-commissioned officers, and yet this is a most important point: for, no matter how well they ride, if they have to be thinking of their horses they will neglect their work on parade.

N.B.—Squadron commanders should satisfy themselves that all ranks are mounted on horses to suit their height, weight, etc., as far as possible.

40. Each squadron should then be put through a thorough course of riding drill and post practice under its own officers preparatory to beginning, or as a portion of, its annual squadron training, special attention being paid to the contents of para. 18. I feel I cannot lay too much stress on the importance of the above.

41. Annual squadron training should be carried out simultaneously by all four squadrons. Three squadrons daily, the fourth in turn taking all duties. For instance, on Monday A, B, C squadrons for training, D for duty, on Tuesday A, B, D squadrons for training and C for duty, and so on. The advantages of this system being that the instruction of the regiment is equally advanced throughout, both men and horses get an occasional rest, and the commanding officer can rely on his regiment for drill without delay.

42. At the beginning of the drill season the squadron commanders should combine and prepare a general programme of drills, etc., for carrying out the annual training of their squadrons, with due regard to the instruction already given during the Summer Course and the probable time at their disposal, for the approval of the commanding officer, who will, however, give them a free hand in carrying out all details.

43. If the Summer Course has been thoroughly done, and full time is available for squadron training, the following programme might be taken as a general guide for carrying it out :—

Period.	SUBJECTS OF INSTRUCTION.		REMARKS.
	Morning.	Evening.	
1st (15th to 31st of October).	Riding drill-combined with practice of pace and post practices.	Theoretical examination in Drill, Part III, up to Section 17. Foot Drill, Part II, including Sections 34	All officers and duffadars will have opportunities given them of drilling rides. They will also be examined in leading troops over the measured distance at all paces.

Period.	SUBJECTS OF INSTRUCTION.		REMARKS.
	Morning.	Evening.	
		—36, besides sword, lance and carbine exercises. The above to be carried out on alternate days.	The post practices will be very correctly done. To prevent crowding and delay two troops will be told off for riding drill and the other two for practising pace and post practices, alternately, under half-squadron commanders.
2nd (1st to 10th of November).	Troop drill combined with attack and defence drill and mounted combat.	Theoretical examination in Drill, Part III, up to Section 21, every third day. Foot drill and "Rope" drill for backward men as necessary.	The half-squadron commanders will superintend the instruction of their troops by troop commanders, but will give them as free a hand as possible.
3rd (11th to 18th of November).	Squadron drill combined with tent-pegging and line-cutting.	Theoretical examination in Drill, Part III, up to Section 25, and "Manœuvre," Part IV, up to Section 7, every alternate day. Further instruction of all ranks as ordered.	After the four troops have been separately inspected and passed by the squadron commander, they will be joined in squadron under his immediate command for instruction. All officers will be especially instructed in drilling the squadron by the best methods. Trumpeters will be carefully practised in sounding at rapid paces.

Period.	SUBJECTS OF INSTRUCTION.		REMARKS.
	Morning.	Evening.	
4th (19th to 30th November).	Squadron drill combined with pistol practice. Detached duties.	Theoretical examination in Drill, Part III, up to Section 25, and "Manœuvre," Part IV, up to Section 37, on alternate days. Further instruction of all ranks as ordered.	At drill occasionally, and at manœuvre invariably, the training will be based on a definite supposition and object and carried out, as far as possible, under the conditions of actual warfare. If necessary, the opposing force will be represented by men not belonging to the squadron under instruction. Pistol practice will have special instruction given in it. Pioneers and signallers will be duly employed.

N.B.—Every instructor should draw out daily a programme of the next day's work, and thoroughly explain it before coming on parade. Due regard being paid to time at his disposal and the necessity for keeping up all that is taught.

A diary of all work done to be kept by squadron commanders in detail for future guidance.

44. At the end of the course the commanding officer will put each squadron through a searching examination, testing the proficiency of all ranks in the duties in which they have been instructed during the training, of which he will prepare a report according to the form given on page 505 *et seq.* and keep it for future record.

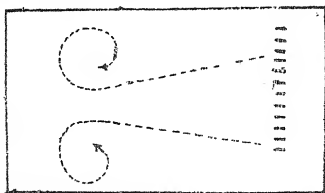
45. The following notes regarding the above programme of training will be found useful :—

Examine the officers and non-commissioned officers to see that they are up to the mark still,—*vide* para. 19.

The following exercise practised in the *Manège* will be found a very useful test, *viz* :—

The squad is formed in line ; the instructor then calls out one or more men ; tells each the hand to which he has got to work, and the pace, as well as the movements to be performed.

The usual thing is to call out two men : order one to work to right and other to the left (at the gallop for men who can ride fairly well), a certain number of turns and circles are performed, then the men work towards the other hand, go through the same movements and fall in again, thus :—



The squadron should be instructed in jumping as laid down in para. 17. Troops should go over the jumps by ranks (which should be at least one jump between ranks) at open files with carried lances. Horses to be pressed into a hand gallop about four horses' lengths before a jump and steadied to a trot a similar distance after a jump by signal of the rank leader who should keep well clear of his rank so that his signal can be seen. Horses should jump straight and smoothly, and the dressing must be good.

46. A deal of time will be saved by having at least three watches (stop watches if possible) for timing individuals or bodies at this practice. When one of the officers at the arriving point is ready, he should raise his flag as a signal for the officer (previously detailed) at the starting point to put up his flag and begin to start off a pair of men (or bodies), one trotting and one galloping, on separate tracks 50 yards apart. As he starts each pair he should drop his flag to show that he has done so, the superintending officer or time-keeper will also drop his flag at the same moment to show that he has begun to take the time. As soon as the first pair have started, the second officer at the arriving point should similarly ask for a pair, and then the third officer, and so on. Thus, there should be three pairs continually on the course and the practice will be quickly done. The officers at the arriving point must be very careful not to raise the flag until they are ready, otherwise there will be confusion. A perusal of the comparative table of cavalry paces of foreign nations given on page 540 will be found instructive.

Practice of Paces for
Manœuvre.

47. When the ordinary post practices (para. 24) have been mastered, the following exercise is recommended, *viz.*, place some posts with straw heads (representing a man standing) together with stuffed dummies on the ground over an area of about 150 yards square, and let the men ride at speed at them with lance or sword, the positions of the dummies being so arranged as to ensure the lance and sword being properly used on the near side as well as the off.

48. The responsibilities of the troop commander have recently been greatly increased in matters of instruction, and the points to be assured before a troop can take its place in squadron laid down. It is, therefore, only necessary to point out the usual mistakes made and to be guarded against:—

(1) Rules of dressing at the halt often neglected and horses allowed to shift about.

(2) Lances not carried perpendicularly with the back of the hand to the front and thumb level with the shoulder.

(3) Accoutrements, saddlery and bitting, not properly inspected.

(4) The troop commander when instructing does not always place himself in the best position for supervising, so fails to instantly correct faults before they spread. For instance, on giving the order "Advance by sections from the right," he often remains in front instead of moving quickly round to the rear of the section to see that the right guide has taken up a correct

direction and that the column covers correctly. He should take up a similar position on the order "Sections right," "Head, right wheel."

On the command "Sections right (or left)," the troop commander should place himself on the left (or right) flank and see that the right (or left) hand section makes a true wheel and takes up a correct direction to the right (or left) and that the column covers correctly.

(5) Centre guides do not cover and follow their leaders exactly, and men do not ride straight to their front.

(6) Troops do not cling to their centres, but to the centre of the squadron instead.

(7) Directions, distances, covering and dressing, are not sufficiently accurately taught in increasing and diminishing the front.

(8) Men do not ride their horses up to their bits with sufficient pressure of the leg to ensure smoothness and to prevent unevenness of pace, especially in column.

(9) Changes of direction in column are too rapidly taken up, causing undue increase of pace in rear. The leading body should, if anything, slightly decrease the pace till the column has been re-formed.

(10) The troop commander slurs over little mistakes in his anxiety to do several movements instead of one at a time correctly.

(11) One movement is scarcely finished before another is ordered.

(12) The troop commander does not keep a sufficient distance off from his troop when drilling it, and often does not lay sufficient stress on the executive word of command.

(13) Non-commissioned officers know their books, but not how to apply their knowledge.

(14) No talking should on any account be permitted.

49. If the troops have been thoroughly instructed, the squadron commander has an easy task. He should, however, be careful that they are all equally well instructed and that there is no chance of any of them being returned for further instruction which would delay the training of his squadron. The faults enumerated above as usually found in the troop refer equally to the squadron. In addition, the squadron commander must bear in mind the following points:--

(1) To place himself in the best position for supervising instruction and correcting mistakes, for instance—

(a) "Advance in squadron column." See that the troops move off at the regulation pace in time and correctly. Wait in rear to see that the direction is correct, then gallop up to the directing flank to see that the distances and dressing of each troop are correct.

(b) "Change of direction of the head of the squadron." See that the exact direction is taken.

by the leader by selecting some point to march on. See that the covering distances and dressing are correct.

(c) "A wheel about of troops in column." He should drop back some distance in rear, cover off the flank to which he intends wheeling about, then move off 4 (or 8 yards) to the right or left as the case may be, and then sound troops right or left about wheel. Now, if the wheel about on a moving pivot has been correctly performed, and the new direction correctly taken, he should be covering the same flank as the troops advance towards him.

(d) "Line to the front." He should get well out to the front before giving the order. When he has done so, he should first go to the right to see that the 2nd troop comes up well, and then to the left to see how the 3rd and 4th troops come up. If done at the trot or gallop, the rear troops should come up at as fast a gallop as is compatible with good order.

(2) To listen attentively and take in orders quickly, and instruct all ranks to do the same.

(3) To see that all words of command are accompanied by the corresponding signal with the sword.

(4) Have men especially trained as ground scouts.

(5) That the senior and junior officers are instructed in drilling and moving the squadron and a troop respectively on to a "fixed" and "moving" base.

For instance, the squadron being in line is required to take up a position in column of troops in rear of markers halted, or a troop moving in column of sections is required to form line on markers moving at a trot in any direction.

(6) The senior officers must be able to meet attacks while manœuvring a squadron, and junior officers while manœuvring a troop.

(7) Troop leaders must keep their troops always solid and assist the squadron commander to form line rapidly in any direction and attack with dash.

(8) The enemy must be met at full charging pace. If there is no time to form the whole squadron, the nearest troop must be sent to break the force of the blow, while the remainder is brought up in support, and the whole "attack," "break up," etc., gone through.

50. This should be carried out with spare ammunition, and if the horses have been properly trained as recommended in page 33, there should be no delay. It might with advantage wind up a morning's work, and the oftener the better.

51. If the instruction in reconnaissance work has been systematically carried out, and all ranks have been thoroughly taught their "Protection" duties, *viz.*, outposts, advanced, rear and flank guards during the Summer Course, the squadron commander will now be able to commence their instruction in "Information" duties; but, if not, he will be handicapped and must make up for lost time.

52. The squadron commander should prepare simple tactical schemes for the practical instruction of his squadron in the important duties enumerated below, as far as possible, under the conditions of actual warfare:—

Tactical Schemes by
Squadron Commander.

- (1) Reconnoitring the enemy and destroying his magazines, railways or telegraphs, or seizing special points of vantage, such as bridges, railway stations, etc.
- (2) Reconnoitring the enemy and screening the movements of the squadron.
- (3) Reconnoitring the enemy and protecting railways, telegraphs, etc., from his raids.
- (4) Requisitioning and foraging.
- (5) Surprises and ambushes.
- (6) Information of a country.
- (7) Section of outposts when halting by day or night for a period of one or more days, or on the march from day to day.
- (8) Occupation and protection of villages, cantonments and bivouacs.
- (9) Protection of troops on the march by advanced, rear and flanking guards.
- (10) Attacking an enemy in position.
- (11) Defending a position against an enemy's attack.
- (12) Escorts for convoys (stores, baggage, ammunition, prisoners, etc.).

53. Of all the duties enumerated above perhaps the most important is "Reconnoitring and screening an enemy and screening the movements of the squadron." Reconnoitring and Screening Scheme for a Squadron. The following general idea and orders with map for carrying out a scheme of this kind according to our regulations is given, but a more concentrated formation would be better, *vide* para. 81, page 81.

JHIND LANCERS.

GENERAL IDEA.

Information has been received that a raid is to be made on the city of Sangrur, and that the enemy has been seen crossing the railway near Raja Mazra. The Jhind Lancers are ordered out at once to discover the enemy's direction of advance and strength and to screen the movements of a mixed force sent out to drive him back.

SPECIAL ORDERS.

The Jhind Lancers (three formed and one flag troop) will proceed under the command of Ressaldar Didar Singh as an advanced squadron in a north-westerly direction at 9 A.M. to-morrow in accordance with the general idea as follows:—

The supporting troops (one formed and one flag) will be on the line east and west of Andheri (E 9), with their advanced patrols 600 yards in front, at 9-45 A.M., where

they will halt until 10 A.M., to establish communication.

The advance will be continued at 10 A.M. and a second halt made on the line Kanjla (C 6) and Ladda (F 6) at 10-45 A.M. till 11 A.M., to establish communication again.

The advance will again be continued at 11 A.M. and if no enemy is in touch a third halt will be made at 11-30 A.M. on the line east and west of Pindni (E 4) as march outposts until further orders are received.

A head-quarter (or supporting) squadron will be represented by flags supplemented by eight men for patrol and orderly duty and will follow roughly the central route of the advanced squadron. All reports to be sent to the officer commanding reconnaissance as under, till further orders :—

Up to till 10 A.M. Andheri (E 9).

From 10 A.M. to 11 A.M. to Khalherian (E 8).

Later———to Panawal (D 5).

A connecting post to be established at Andheri (E 9), Khalherian (E 8) and Panawal (D 5) consecutively, so as to facilitate the transmission of messages at the above hours.

Two non-commissioned officers' patrols will start at 7-45 A.M. The right patrol to go four miles up the Maler Kotla road, then in a north-westerly direction through Ladda (F 6) towards Kakarwal (F 2).

The left patrol through Andheri (E 9), Kanjla (C 6) to Raja Mazra (D 2). They will report direct to the officer commanding the reconnaissance. After reporting getting touch they need only concern themselves with formed bodies of the enemy, *i.e.*, a troop or more.

The enemy will be represented by one formed and remainder flag troops under the
Enemy. command of Ressaldar Jang Singh
who will act in accordance with sealed orders.

Men with numbers representing the enemy's patrols will be dotted throughout the depth of the reconnaissance in order to ascertain whether the zone of country has been thoroughly searched. These men after giving up their numbers will proceed as may be previously directed.

General Orders.

Dress—Field day order.

Five (5) rounds of blank ammunition per man will be taken.

Mid-day feed will be carried.

Bhisties, with canvas troughs for watering horses, will be sent out.

All watches to be compared before starting.

The pace of the trot will not be exceeded except in cases of urgency.

Two flags will represent one troop, red for Jhind force and yellow for enemy. Great care is to be taken that correct frontage and depth are maintained by these troops in all formations.

The formed troop of the enemy will be recognised by white *puggris*.

Limits of operations on the east G 2-10; on the west C 2-10.

Ressaldar Jang Singh commanding the enemy's force will act in accordance with the following sealed orders, *viz* :—
Movements of the enemy.

Take up a position with one formed and five flag troops at the bridge over canal near Benra (G 5) at 8 A.M. At 9 A.M. under cover of a demonstration slip away four troops to Panawal (D 5) with orders for the other two troops (one formed and one flag) to join you there at 10-30 A.M. At 10-45 A.M. endeavour to break through the screen of the Jhind force in the direction of Khallerian (E 8) and attack the head-quarter squadron of the Jhind Lancers.

If the enemy is defeated the Jhind Lancers will retire and form a line of outposts between the first mile-stone on the Maler Kotla road (F 10) and the village of Thales (G 8).

Two non-commissioned officers will be detailed to keep a diary (on the form circulated) of all messages received, and to show the probable positions of both forces on the map if possible, or to calculate them at any moment if required by the officer commanding the reconnaissance.

54. As the enemy was close and the chief object was to screen the force in rear from the enemy's patrols, the squadron covered only 2 miles of front, but a little more depth. The patrols were, therefore, 600 yards apart and were preceded by scouts with orders to keep within sight and not further than 600 yards off.

The patrols kept a distance of 600 yards ahead of their support so as to be within communicating interval of each other, and in sight of it, and therefore never to lose touch. The head-quarter or supporting squadron kept about $1\frac{1}{2}$ miles in rear until the direction of the enemy's attack became known, when it closed up. The above distances should seldom be increased under the circumstances.

55. The pace of the advance was directed by the officer commanding the advanced squadron. He placed a connecting file half-way between the support and the patrol of direction to regulate the pace and direction and prevent touch being lost, also to relieve messengers when required. The officer commanding the advanced squadron had to be on certain lines at certain hours, and it was left to his discretion to decide the pace he would go at, to get there in time. This enabled him to spend more time looking from points which afforded a view to the front and less time in the hollows, than if he was ordered to move steadily at a uniform pace regardless of the character and general features of the

country marched through. As a matter of fact, the advance ordered was too slow and including halts should have been five miles an hour. The officer commanding reconnaissance remained chiefly with the reserve or head-quarter squadron and arranged for connecting posts along the line of advance and frequently went ahead and waited there for messages. The posts, however, were much closer than under service conditions.

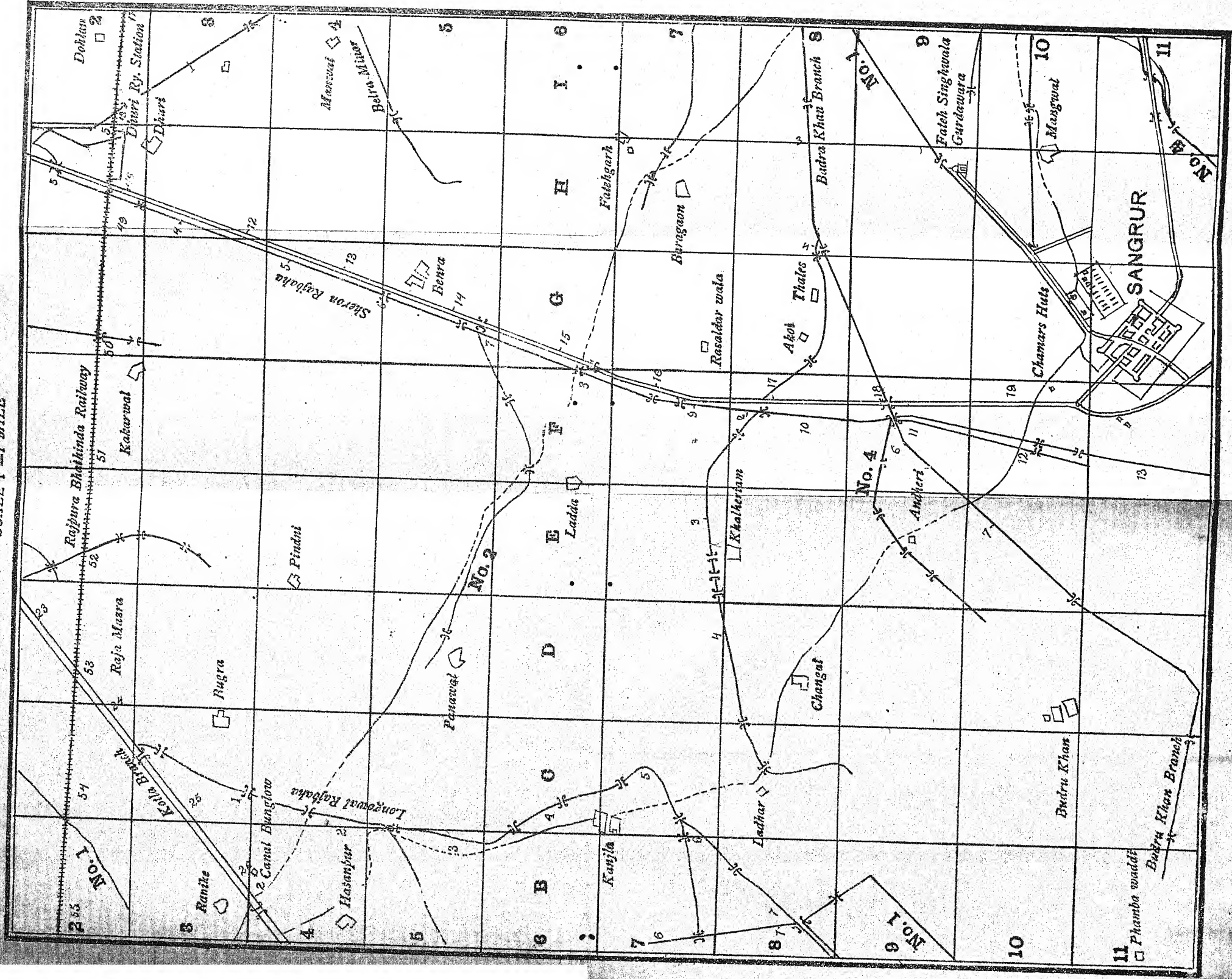
Method of Communi- 56. The following method for
cation adopted, communicating, etc., was adopted,
 viz:—

The right troop commander of the 1st, 2nd and 3rd patrols was held responsible for the direction of the advance, and therefore remained with No. 3 patrol chiefly. He was warned to keep his distance from and take up the pace of the support at once, and, if necessary, to drop a connecting file.

The left troop commander of the 4th, 5th and 6th patrols was held responsible for keeping touch with the patrol of direction, and therefore remained chiefly with No. 4 patrol. On arrival at a halt the left troop commander immediately let the right troop commander know "all's well" or otherwise, and the latter forwarded this report with his own sharp to the officer commanding advanced squadron either through the connecting file or direct according to circumstances. As the troop commanders were generally so close to each other, the left troop commander found it the shortest and safest plan to send all messages through the right troop commander or whoever was in command of the patrol of direction.

SANGRUR (HIND STATE)

SCALE 1"=1 MILE



57. The diary of messages received and despatched was carefully kept, so that the probable positions of both forces could be seen at a glance on the map by the officer commanding the reconnaissance and ought to have guided him in the subsequent orders given.

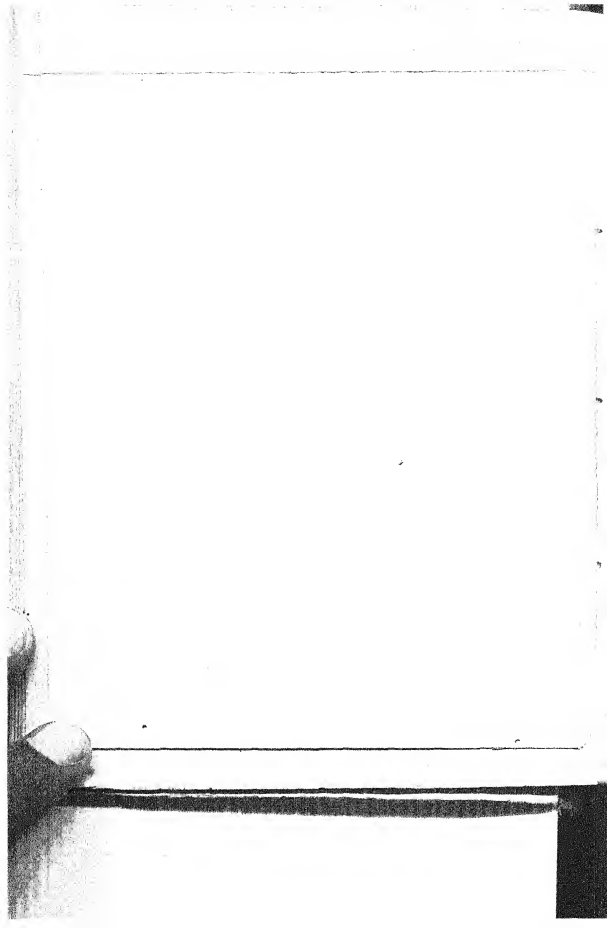
58. At the conclusion of the operations I assembled all the officers and non-commissioned officers and in their presence made the officer commanding reconnaissance read out his diary and explain the orders he gave from beginning to end, on the map. The officer commanding the enemy then explained his movements also exactly. After hearing both I was of opinion that, although victory had been gained by the Blind force, it was more through guess work and luck than by the assistance of the reports sent in, which alone could not have justified the action taken by the officer commanding the reconnaissance, as they were incomplete and not very accurate.

59. The following errors are usually made in reconnoitring and screening duties, so must be guarded against by the squadron commander :—

Errors to be guarded against in detached duties of a Squadron.

(1) Too many men employed. A squadron is often ordered to do work which an officer's patrol or two could easily accomplish.

(2) Men flittered about instead of being kept concentrated as much as possible.



(3) Patrol commanders not sufficiently instructed what to do when the enemy is met with under all the varying circumstances which may occur.

(4) Patrols not hanging on to the enemy when found.

(5) The importance of accurate information not sufficiently impressed on all ranks.

(6) Squadron commanders and others sending messages not giving definite enough instructions as to the exact direction where and to whom the orderly is to take the message, with the result that important information arrives late and horses are unnecessarily used up.

(7) Important information (*e.g.*, that a large force of the enemy is approaching, or a break through or attempt to break through the screening line has been made) not sent in duplicate (verbally if there is no time to write), one man to the officer commanding advanced squadron concerned and another to the officer commanding reconnaissance.

(8) All units not designated by their position in the reconnaissance as under :—

Right Advanced Squadron—for short R. A. S.

Centre „ „ „ C. A. S.

Left „ „ „ L. A. S.

Patrols ordinarily six being numbered from the right of their respective squadrons should be correctly designated, *e.g.*, O. C., R. A. S., writes: “My No. 4 Patrol

reports," etc., which at once gives the position of the occurrence.

(9) Each detached portion of a reconnaissance not moving or halting with the necessary protection for itself.

(10) Unnecessary wear and tear of horseflesh by men galloping all over the country trying to capture prisoners and each other's weapons instead of acquiring and transmitting accurate information.

(11) Slowness of the advance. Advantage not being sufficiently taken of getting over open ground at a rapid pace.

(12) Ignorance of localities within 20 miles of cantonments displayed by all ranks.

(13) Officers should know pretty nearly how long it will take to rally on any given point, otherwise they cannot reckon where to resist an attack.

(14) Horses not sufficiently spared. Patrols often ride at a rapid pace unnecessarily, and seldom think of dismounting to ease their horses or water them, etc. The pace of the trot should not be exceeded except in cases of emergency.

(15) Signallers not sufficiently employed to advantage.

(16) Rules for the conduct of field manœuvres violated (*vide* page 137).

2nd Period.

60. If the commanding officer has given each squadron a searching examination, and considers that they are all equally well trained, he can now begin steady regimental drill. If, however, he discovers any weak points, he must let the squadron commanders have their squadrons again for a few days to rectify them.

61. To begin with, the commanding officer must drill his regiment for purposes of instruction only, pointing out every little mistake and never allowing any movement to be done carelessly. He should call out all the senior officers in turn for this purpose and order them to do certain movements and point out to them any mistakes they may make. They should, moreover, be practised in moving the regiment at all paces on to a "fixed" or "moving" base by the shortest routes, taking care that the regiment does not overshoot the base in so doing. Finally, all the officers should be given tactical problems, *vide* Examples given on page 581 *et seq.*

62. The mistakes generally made and the various important points to be noted during instruction in troop and squadron drill (which have already been enumerated), apply equally to regimental drill and must be borne in mind accordingly, and the following in addition:—

(1) Officers, when drilling the regiment, must not only place themselves in the best position for

supervising each movement, but for having their words of command heard, *i.e.*, with regard to the wind, etc. They generally stay too close and do not employ the trumpeter when they should.

(2) Orders and trumpet sounds must be acted on at once.

(3) Trumpeters are too slow in taking in orders, and frequently do not sound in the right direction.

(4) The principle of every leader looking and riding straight to his front must be insisted on.

(5) The commander of the squadron of direction seldom realises what an important position his is, for on the direction and pace the drill of the whole regiment depends. In the former case, he must invariably have a point to lead on and take up another if a different direction is ordered. In the latter case, he must be very careful that during movements, such as changes of direction or wheel about of troops, the pace is not hurried, but, if anything, somewhat diminished till all the squadrons have formed.

(6) Overshooting the base must be specially guarded against.

(7) The commanding officer must be very careful in impressing on all officers, when drilling the regiment, the necessity for not hurrying between movements and correcting all mistakes made in one movement before commencing the next.

(8) Drilling by trumpet sound and signal should be regularly practised.

(9) Officers are generally slow in taking in orders and sometimes go off without understanding what they have to do.

63. As soon as the regiment has begun to drill steadily and accurately, the commanding officer can dispense with the "instructional" portion of his parade and drill the regiment regularly on a definite supposition or object, as far as possible, under the actual conditions of warfare; noting, however, all mistakes made and pointing them out at the conclusion of the parade.

Points to be observed
in the "Attack."

64. The following points regarding the "attack" must be borne in mind:—

- (a) The senior officers must be prepared to meet attacks from all directions while drilling the regiment.
- (b) In meeting attacks, be careful to note the force opposed to you and do not send five squadrons against three, or two of them will charge the air. Better to send three squadrons against three and keep the other two in support or send one for a flank attack and keep the other in support.
- (c) If you have not time to get your regiment into line direct your nearest squadrons to

meet the attack while you bring up the remainder, as best as you can, and attack in *echelon*.

- (d) When you do attack, do so at full charging speed.
- (e) After "breaking up" instead of circling round each other, teach the men to hack their way through an imaginary enemy (or dummies placed as described in para. 47, page 44) and to rally rapidly beyond.

Notes on Parade
movements.

65. In parade movements the following notes will be found useful :—

On the command "march past by squadrons" the adjutant should get the markers out smartly in line and then all together go out at a gallop to the respective points on the passing line. The markers should be previously trained to taking up their dressing and only "markers' eyes front" should be heard from the adjutant. On moving off, the leading squadrons should slightly increase the pace in wheeling, to prevent the rear squadrons checking. The troops should all wheel smartly round.

In ranking past by sections. The pace should be regulation, but there must be life about it, horses well ridden up to the bit with the leg and reins short.

For the gallop past, instruct A and D markers to increase their interval to 120 yards after the last squadron has wheeled off after ranking past. Gradually increase the pace from C marker and decrease it from B. Every rank should be distinct.

The lance exercise is generally done after the gallop past, so you must either go beyond the parade line or from the parade line wheel right into line, so as to get sufficient room to complete the lance exercise without over-riding the markers. If you wish to be smart, never halt after wheeling into line, but sound "from the right of fours to the front file" and the "gallop" at once, and insist on the men taking up the pace and the covering at once. Don't sound the "lance exercise" till the men are steady and covered. It is more important for this show performance to have the time good and the covering maintained than the points very accurately given. Reverse your front by "files about" or "right turn" twice, see that the pace (canter) is maintained and that the horses don't trot and do the 1st Division, going to the rear, the 2nd Division to the front, then the Lance Manuals and re-form ranks. The squadron intervals should be perfect throughout. Now recall your markers.

66. If the squadrons have been properly grounded in detached duties during their training, the commanding officer will be able to spend one whole day a week in the country during this period in carrying out some tactical idea; but, if not, he should point out the weak points and allow the squadron commanders to rectify them before the 3rd period arrives.

67. The annual course of pistol practice must be thoroughly done. As I have already pointed out it is a very important duty.

Annual Course of
Pistol Practice.

3rd Period.

68. At the beginning of this period the drill of the regiment ought to be perfect so as to allow of more time being devoted to brigade drill, manoeuvre, annual long reconnaissance (page 590), chart and compass competition (page 569), assault-at-arms, field firing, etc. The detached duties enumerated in para. 52, page 49, to be carried out by the squadron according to tactical ideas, apply equally to the regiment, although, of course, slightly different dispositions have to be made. The commanding officer should, therefore, have a set of schemes prepared for similarly exercising the regiment in all those duties.

69. The following example of practising a regiment in reconnoitring and screening duties with map according to our regulations is given, but a more concentrated formation would be better, *vide* para. 81, page, 81.

"Reconnoitring and Screening" Scheme for a Regiment.

PATIALA LANCERS.

GENERAL IDEA.

A hostile force is reported to be advancing on Patiala from the direction of Lahore. A cavalry brigade is ordered to reconnoitre the enemy and cover the movements of an opposing force.

SPECIAL ORDERS.

In accordance with the general idea the Patiala Lancers will form the advanced regiment of the brigade and will proceed in a northerly direction at 9-45 A.M. to-morrow, as under:—

The centre advanced squadron (A) will take the line
Movements of the Ad- Ablawal Bridge (E 8), Sohna (E 6),
vanced Squadrons. Rabaglan (D 5) towards Chillela
(E 1). The right advanced squad-
ron (B) will proceed by the Baradari road, city canal
bridge, east of Tirpari (F 8), through Hasanpur (G 6),
Mazri (H 4) towards Ret Kheri (H 2). The left ad-
vanced squadron (C) will take the line Ase Mazra (B 7)
towards Ustal (B 1).

Squadron commanders will give detailed orders re-
Advanced Patrols. garding the routes to be taken by
their patrols, a copy of which will
be submitted to the officer commanding the reconnais-
sance before starting.

Communicating posts, temporary, of one non-com-
Communicating Posts. missioned officer and three men
will be established, at previously
arranged places, between the advanced squadrons, so as
to keep up lateral communication.

The supporting troops of the advanced squadrons will
First Halt. be on the line Ase Mazra (B 7),
Ablawal (D 8) and Tirpari (F 8)
with their patrols 600 yards in front at 10-30 A.M.,
where they will halt until 10-45 A.M., to establish com-
munication.

The advance will be continued at 10-45 A.M. and a second halt made on the line Lachkani (C 5), Baran (G 5) at 11-15 A.M. till 11-30 A.M., to establish communication again.

The advance will again be continued at 11-30 A.M., and if no enemy is in touch, a third halt. third halt will be made at 12 noon on the line Ret Kheri (H 2), Bhagan Mazra (F 2) and westwards as march outposts until further orders are received.

The head-quarter (or supporting) squadron will be represented by flags supplemented by twelve men for patrol and orderly duty, and will follow roughly the route of the central advanced squadron. All reports to be sent to the officer commanding reconnaissance as under, till further orders :—

Up till 10-30 A.M. to Ablowal Bridge (E 8).

From 10-30 to 11-30 A.M. to Sohna (E 6).

Later, to Lang (D 4).

A connecting post of one non-commissioned officer and three sowars from the head-quarter squadron to be established at the Ablowal Bridge (E 8), Sohna (E 6) and Lang (D 4) consecutively, or elsewhere as may be ordered to facilitate the transmission of messages at the above hours.

Two officers' patrols will start at 8-30 A.M. Right
Officers' Patrols. patrol under Jemadar Gajan
Singh through Tirpari (F 8),
Mazri (H 4), Bhagan Mazra (F 2) to Chillela (E 1).
Left patrol under Jemadar Waryam Singh through Ase
Mazra (B 7), Lachmi (C 5), Mathi (C 3) to Chillela (E 1).
They will report direct to the officer commanding
the reconnaissance. After reporting getting "touch"
they need only concern themselves with formed bodies
of the enemy, *i.e.*, a troop or more.

The enemy will be represented by D squadron and
The Enemy. remainder flag troops under the
command of Ressaldar-Major Nand
Singh, who will act in accordance with sealed orders.

Men with numbers representing the enemy's patrols
will be dotted throughout the depth of the reconnais-
sance. These men after giving up their numbers will
proceed as may be directed beforehand.

General Orders. Dress—Field day order.

Five (5) rounds of blank ammunition per man will
be taken.

Mid-day feed will be taken.

Bhisties, with canvas troughs, will be sent out for
watering horses.

The pace of the trot will not be exceeded except in
cases of emergency.

Two flags will represent one troop, red for the Patiala force, white for the enemy. Great care is to be taken that correct frontage and depth are maintained by these troops in all formations.

The formed troops of the enemy will wear blue serge coats and light-colored *puggis*.

The following will be the limits of operations :—

On the East ... H 1—8.

On the West ... B 1—8.

Ressaldar-Major Nand Singh commanding the enemy's force will act in accordance with the following sealed orders, *viz* :—

Sealed Orders for the
Enemy.

Take up a position with D squadron (three troops) and five flag troops at Chillela (E 1) at 9-45 A.M. At 10-15 A.M. move to Mathi (C 3) with your whole force and then, under cover of a demonstration, slip away six troops at 11 A.M. to Bhagan Mazra (F 2) with orders for the other two (one formed and one flag) to join you there at $\frac{1}{2}$ to 12 noon. At 12 noon try to break through the screen of the Patiala force and attack the head-quarter squadron.

If the enemy is defeated, the Patiala Lancers will retire and form a chain of outposts about one mile north of Ablawal Bridge (E 8) running towards Tirpari (F 8) on the east, and Indarpur (B 8) on the west, till dusk,

when a second position south of the Patiala canal will be taken up.

An officer (the adjutant if available) assisted by two intelligent non-commissioned officers will keep a diary (on the form circulated) of all messages, and will endeavour to show the probable positions of both forces on the map, if possible, or calculate them at any moment if required by the officer commanding the reconnaissance or outposts.

70. The conditions under which the above scheme was carried out were similar to that given as an example on page 50 *et seq.* for a squadron. The Formations adopted by the Regiment. The frontage and depth of each of the three advanced squadrons were therefore the same; and the head-quarter squadron followed in rear of the centre at the same distance, until the exact position of the enemy's main force was discovered.

71. The centre advanced squadron directed the advance of the regiment, the other two squadrons were in the same formation and their patrols kept touch similarly, but troop commanders more frequently visited their inward flank patrols to ensure this. Advance of the Regiment how regulated.

72. The supports communicated with each other by means of communicating posts and with the head-quarter squadron through connecting posts at pre-arranged places on the line of advance. The right Method of Communication adopted.

and left advanced squadrons took extra precautions regarding their flanks.

N.B.—The plan adopted for the transmission of messages by some regiments would have been safer, *viz.*, for the officer commanding supporting squadron to maintain communication with the advanced squadrons by a chain of patrols (one non-commissioned officer and three men) along the centre of the line of advance at 600 yards distance from each other. All orderlies to take the shortest route to the central line and to hand over the message to the first connecting patrol they meet, and to rejoin their squadrons.

73. The officers' patrols sent in excellent information. No reconnoitring patrols were therefore required to be sent from any of the advanced squadrons.

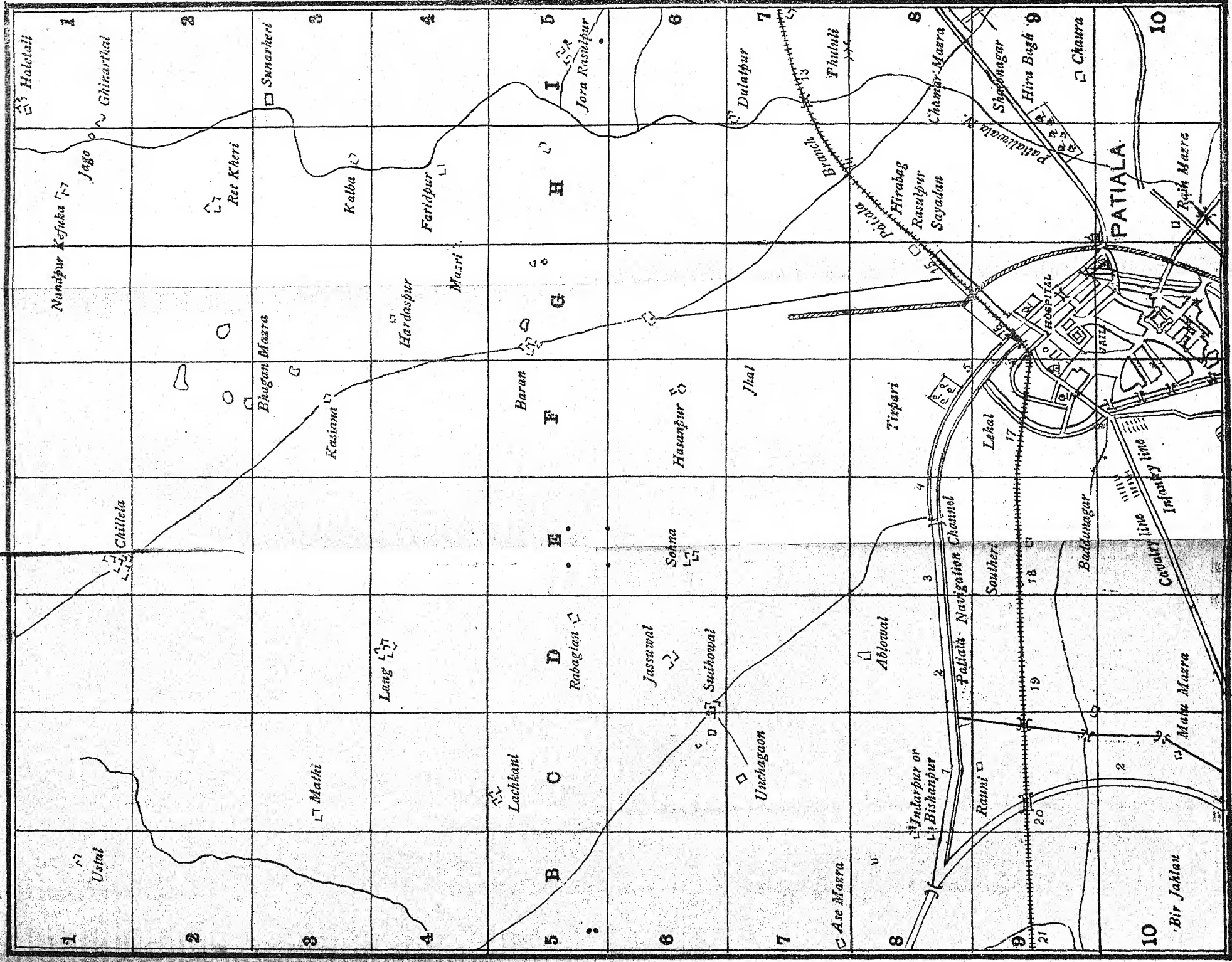
74. The information received, as shown by the diary, was accurate, and the officer commanding reconnaissance was fully justified in concentrating at Lang (D 4) to attack the enemy.

75. The errors usually made by squadrons in reconnoitring and screening duties enumerated on pages 56 to 58, apply equally to regiments and the following besides :—

- (1) Reconnaissance practised on too cramped a scale.
- (2) The whole reconnaissance being dislocated by the break through of a single squadron. Only those patrols should fall back, which are driven back. The remainder should remain halted where they are and wait for orders, and immediately send back information and communicate with squadrons on right

PATIALA.

SCALE 1"=1 MILE



and left so that those squadrons may not go floating on into space.

(3) If a break through of the screening line does occur, the information should be sufficiently early and accurate so that sufficient force may be brought up to drive the enemy back before he has obtained his object (i.e., to find out the position of your main force) and that the communication between the various portions of your screening line may be so good that it is not dislocated throughout.

(4) If patrols cannot get the required information, a solid body like a squadron should be detached to break through the enemy's line and procure it.

(5) The concentration of a reconnaissance not sufficiently practised, taking as a rule an absurd time and some portion being lost altogether through bad communication.

(6) Want of enterprise, the whole line being sometimes delayed, because one squadron shows a front in front of the line, the support not being called up to drive the squadron back.

(7) Slowness of the advance. An average of five miles an hour including halts should be kept up. The best plan being to cover the five miles as fast as the ground and the condition of the horses will allow, and to halt for the remainder of the time to establish communication and take some rest.

76. Few commanding officers excel in drilling a brigade. Their usual excuse is want of opportunity. No doubt, this is true, as even in stations where two or more

cavalry regiments are stationed, sometimes, the General Officer Commanding cannot spare them for purely cavalry drill. But there is no reason why a commanding officer should not form his regiment into a brigade of two regiments rank entire and drill them. He will not only get more confidence himself, but will give all his leaders excellent opportunities for learning more of their work.

The drill of a brigade is commonly considered to be no more difficult than that of a regiment, if it is regularly practised. The same points have to be attended to, and the same faults guarded against in both cases.

The commanding officer should begin by practising himself and all his field officers in forming the brigade on to a fixed and moving base respectively by the shortest routes and at all paces.

Drilling the brigade for purposes of instruction and finally manœuvring it according to a definite supposition and object can then follow. The Brigadier taking care to keep well away from his brigade always.

77. This subject is generally avoided by cavalry as being more suitable to infantry.

Field Firing.

This is a most erroneous idea.

It is a practical test of instruction in dismounted service and shooting; and therefore the greatest interest should be taken in carrying it out annually according to some tactical idea, if possible, in combination with other arms. Previous instruction with blank ammunition is absolutely necessary to ensure good results.

4th Period.

78. There is so much other work to be done during the actual drill season that the annual course of musketry (except pistol practice and field firing) should be commenced on the 1st April and persevered with during the summer, so that by the 15th October there are as few casualties left as possible.

Annual Course of Musketry.

SECTION IV.

79. Can only be practised, as a rule, at large camps of instruction. Brigadiers who have taken the trouble to instruct themselves as recommended should have no difficulty in commanding brigades in division.

Both divisional and brigade commanders should thoroughly study the "Memoranda for Camps of Instruction," page 164 *et seq.*, and the tactical problems given, page 581 *et seq.*

80. The following scheme carried out at the Muridki Camp in 1894 with map will give an idea as to what orders are necessary for exercising a division in reconnoitring and screening duties according to our regulations, but a more concentrated method would be better, *vide* para. 81, page 81.

"Reconnoitring and Screening" Scheme for Division.

The division will be exercised, on the 12th December, as an independent cavalry division covering an army, under the following general idea and orders :—

The army of a northern enemy is advancing on Lahore from the direction of Sialkot. From information received it is known that small bodies of their covering cavalry screen have been seen, on the 11th, on the line Gujranwala, Mokhal (P 17), Satrah (P 22).

The Muridki cavalry division, covering an army marching from the south in the direction of Lahore, has encamped near Bahmanwalla, on the night of the 11th, and receives the following orders :—

I.—*Swaine's Brigade* will form the Right Advanced Brigade, and at 10 A.M. on the 12th will be formed as under :—

Right Supporting Regiment	At a point 1 mile N.-W. of Dhurrou Hindoo Ce 17.
---------------------------	--

Head-Quarter (or Supporting Squadron) R. Advanced Regiment.	Half mile N. of Lamree Bb 17.
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Central Advanced Squadron.	Two miles N. N.-E. of Lamree Bb 17, i.e., $1\frac{1}{2}$ miles N.N.-E. of its head-quarter squadron.
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Right Advanced Squadron,	Half mile N.-E. of Choochora Bb 18.
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Left Advanced Squadron ..	One and a-half miles E. of Choochora Aa 16.
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The general central line of advance of this brigade will be Lammree Bb 17, Kotli-Korutana Y 18, Chukkee Khurd X 18, Mirzapur V 19.

II.—*Richardson's Brigade* will form the Left Advanced Brigade, and at 10 A.M. be formed as under:—

Left Supporting Regiment ..	At Naoul Sadhan Aa 14.
Head-Quarter Squadron, Left Advanced Regiment.	Half mile W. of Nuguleesa Aa 15.
Central Advanced Squadron, Left Advanced Regiment.	Half mile S. of Moongunee-anwalah Z 15.
Right Advanced Squadron, Left Advanced Regiment.	Half mile N. of Choohora Aa 16.
Left Advanced Squadron, Left Advanced Regiment.	E. of Railway half mile E. of Kharee Z 14.

The general central line of advance of this Brigade will be Naoul Sadhan Aa 14, half mile east of Nitranwalee X 15, Kotlee-Dilbagh Rae W 16.

Note.—It will be noticed that the outer flank advanced squadrons are slightly thrown back, and this relative position should be retained during the advance of the division.

These detailed instructions for the first positions of squadrons are given to avoid necessity of report as to position when the screen formation is first taken up, and are not to prevent Brigadiers giving their own orders in conformity with them for the advance and subsequent movements of their brigades.

III.—*Neville's Brigade* will form the Reserve Brigade and will rendezvous quarter mile west of Boutee Mangla Singh Cc 15 at 10 A.M., moving off at 10-30 A.M. with its central line of advance, following the general direction of the Degh Nullah (East bank) in a north-east direction on a line joining Bahmanwalla to Dupyaluh, thence west of Poolshahdowla Y 17, towards Walianwali

V 17. All necessary communication and connection with the supporting regiments of the Right and Left Advanced Brigades will be furnished from the Reserve Brigade.

IV.—Three officers' patrols, each of 16 non-commissioned officers and men, will be sent out from the Reserve Brigade.

The Right officers' patrol (No. 1) will accompany the centre advanced squadron of Right Advanced Brigade to its place of rendezvous and move off from there at 10 A.M. and reconnoitre towards Goralah U 20.

The Left officers' patrol (No. 3) will accompany the centre advanced squadron of Left Advanced Brigade to its place of rendezvous and move off from there at 10 A.M. and reconnoitre towards Tudee Mallee U 1, 6.

The central officers' patrol (No. 2) will be at Dupyaluh Z 16 at 10 A.M., whence it will at once reconnoitre towards Rana U 18.

Officers in charge of these patrols will send in all information direct to the General Officer Commanding, but the men carrying in the messages are to be instructed to show them to the officers commanding squadrons, regiments and brigades, through which they pass on their *direct* way to General Officer Commanding. These officers will sign on the outside of cover to having seen them, and the men are on no account to be detained longer than is necessary to read the message.

V.—The position of the General Officer Commanding will usually be in front of the Reserve Brigade on the line ordered for its central advance, and when not there,

a staff officer with an orderly carrying a flag similar to that of the General Officer Commanding will be left to receive messages. At 11-30 A.M. he will have reached Dupyaluh Z 16 and at 1 P.M. the road near Dboolah X 17.

VI.—The main portions of the division should thus be in their places at 10 A.M. Half-an-hour will be given for throwing out, under the previously issued orders of Brigadiers, the usual reconnoitring and connecting patrols (as laid down in regulations) and establishing communication throughout, before commencing the forward movement, which will take place without further orders at 10-30 A.M., every unit and detachment moving off at that hour.

All watches should be carefully set by the morning gun on the 12th instant.

VII.—The average rate of advance of the division will be five miles an hour, *i.e.*, that at the end of an hour of movement each unit should be at a point five miles further on in the required direction irrespective of its intermediate paces.

At 11-30 A.M. the whole division will halt for half-an-hour wherever each unit may be; and communication and connection, which should have been kept up throughout, will be ascertained to be efficient and in working order. Brigadiers will arrange to transmit to the General Officer Commanding a statement of the exact position of their brigades, during each halt, and outline maps will be provided for this purpose.

At 12 noon the division will continue the advance. At 1 P.M. halt for two hours, water and feed. If within

touch of the enemy at this time the same action will be taken as at peace manœuvres when the "cease fire" sounds; and when the operations are continued, at 3 P.M. each unit will resume the exact position that it was in at 1 P.M.

No further orders will be given for halt or advance which will be made exactly at the times ordered, by the whole division.

VIII.—The enemy's patrols will be represented by men (serge) carrying flags (red ground with white cross): they will be furnished with written messages, which they will hand over when discovered, and furl their flags and be considered out of the operations for the day. These messages will contain a statement of the actual direction in which the patrol represented is supposed to be retiring, and will therefore be a guide to further advance: they must be attached to the message sent in by the officer whose party discovers them.

The enemy's squadrons are each represented by single men (serge) carrying red flags, and will not be approached nearer than 300 yards by forces of less strength.

IX.—When sufficient information of the position of the enemy is forthcoming, orders will be given by the General Officer Commanding for the Division, or a portion of it, to assume a tactical formation; but this is not to prevent Brigadiers giving their own orders as to change of direction, supporting their advance bodies, or retiring on their supports, as may be necessary when once in touch of the enemy. Changing from the reconnoitring to the manœuvring phase being a difficult operation, Brigadiers will

ensure all detachments receiving distinct instructions as to what they should do on a concentration being ordered. Signallers should be freely made use of. An unmistakable signal for concentration on each squadron, such as two men with their horses facing each other, with lances or sword crossed, is also useful, in conjunction with whistles for this purpose.

X.—The whole of the cavalry pioneers of each advanced brigade under an officer, will accompany its central advanced squadron. Any demolition or construction (imaginary) done by the pioneers will be put down in writing by this officer, showing materials used, time occupied, etc., and sent in at once through the Brigadier to the General Officer Commanding.

Obstacles which would cause delay or a detour of the force in rear should at once be reported by reconnoitring patrols.

XI.—The General Officer Commanding desires particular attention to be paid to lateral communications. On receiving information from the front, all officers should, after transmitting it through their supporting units, inform the bodies on their right and left. Brigadiers will note in their diaries what reports reach squadrons in this way.

XII.—Brigadiers will be good enough to send to the Assistant Adjutant-General by on a copy of the subsidiary orders they issue with reference to para. VI, showing also which regiments they name for advance or support.

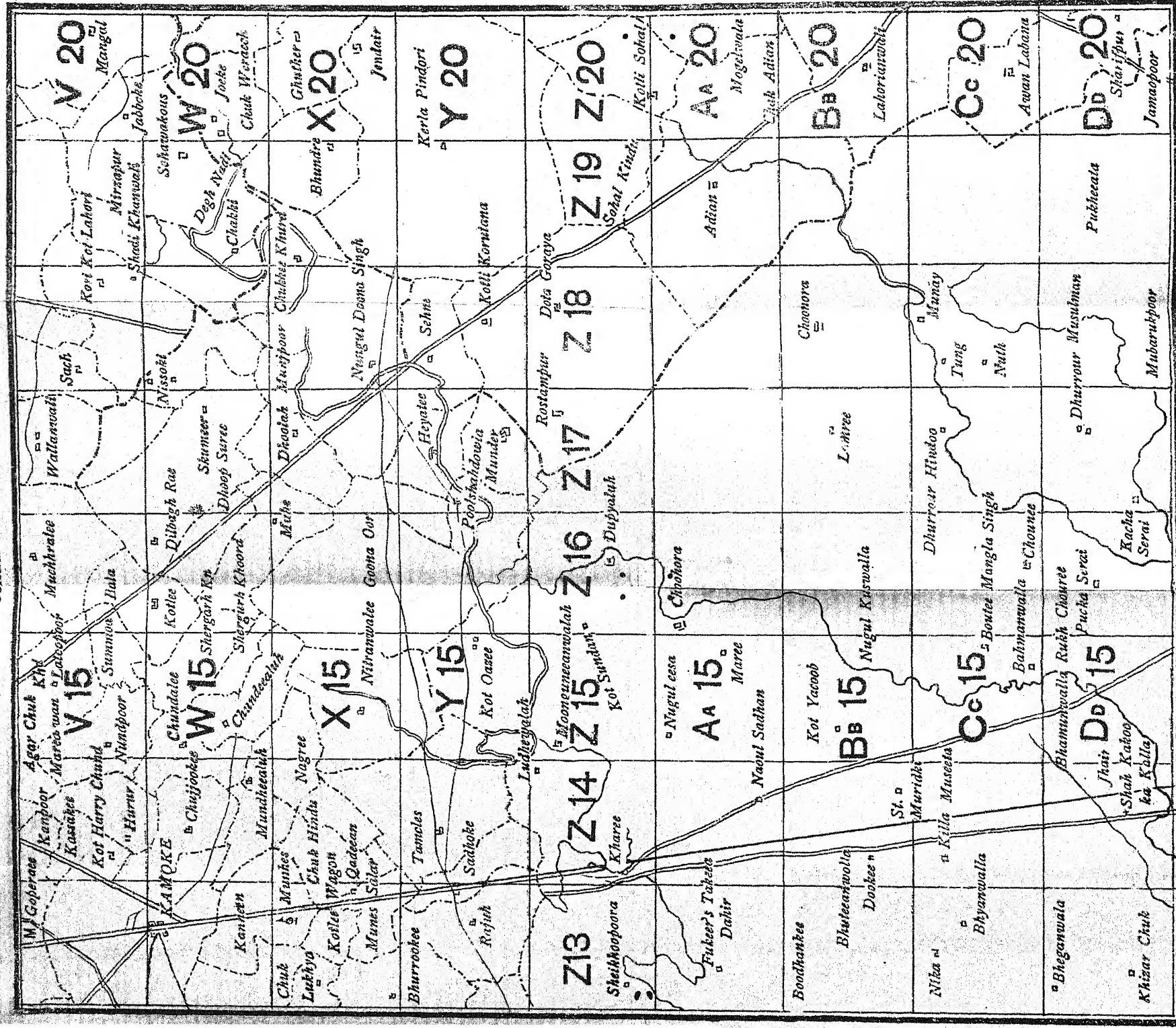
Orders for Officer in Command of Flag enemy on 12th December.

- (1) You will take your force (as per margin) on the 11th December and encamp at Nungal Doona Singh X 18, and by 10 A.M. on the 12th have your flagmen posted as follows :--
- | | | |
|---------------------|---------|--|
| Red and white flag- | | |
| men. | | |
| Regiment | — | |
| " | — | |
| Total 1 N.-C. | — | |
| O. and | 20 men. | |
| Red flagmen. | | |
| Regiment | — | |
| " | — | |
| Total 1 N.-C. | — | |
| O. and | 24 men. | |
| | — | |
- (2) Patrol Flagmen (red and white) 20.
- On the curved line Muchhralees V 16, Kotlees-Dilbagh Rae W 16, Dhoopsuree W 17, Munjpoor X 18, Chukkee Khurd X 19, Weraech W 20, at irregular intervals.

These men, under a non-commissioned officer, will receive instructions to deliver up the messages with which you will furnish them, to any of the reconnoitring force opposed to them, when approached and asked for. Having given up their messages, they will furl their flags and make for a point selected by you, and be marched to camp.

- (3) The Group Flagmen will be placed so that they cannot be seen from a distance by the southern force, but they are not to be hidden away in villages or positions which cannot be approached. They will be numbered from front to rear, and each of their messages will be similarly numbered. You will furnish the Assistant Adjutant-General with copies of these messages (which should be made out in accordance with para. VIII, Divisional Orders for 12th December) on the 10th December.

SCALE 1"=2 MILES.



(4) Your Squadron Flagmen (red flags 20) and an entire regiment will show a division in order of attack, with the first line near Shadi Khanwali V 19 facing south-west. At 12-30 you will move your force at a trot five miles an hour to one mile south of Kotlee-Dilbagh Rae W 16.

(5) At the point where the Degh Nadi is crossed by the road near Sehne V 18 and Nungal Doona Singh X 18, two red flagmen will be stationed with a paper, stating that they are two squadrons dismounted in strong position giving details (imaginary), such as bridge blown up, walls loopholed, etc., keeping in view that they should necessitate demolition, repair or construction of defences to oppose, by the cavalry pioneers of the southern force.

(6) Similarly one of your squadrons will be dismounted at or near Nitranwallee X 15.

81. It has begun to be recognized by cavalry officers in India that the system of stringing out a line of patrols (as a keeper does his beaters for a partridge drive) laid down in our Cavalry Regulations for reconnaissance, by which no concentrated body remains to resist a very sudden determined attack owing to regiments being frittered away in numerous weak detachments, is quite unsuited to this country; and that a method of advancing concentrated throughout a division is more likely to lead to success in beating back a hostile division and gaining information of what is in its rear.

General Principles for
Reconnaissance.

The final objective of cavalry is information regarding the infantry masses in rear, but on the way to them the enemy's cavalry must be routed in the cavalry fight. Therefore cavalry must act concentrated with a minimum number of detachments before the great cavalry engagement. Moreover, patrols to be of any use must at once act offensively and with vigour if they cannot obtain their object by ruse. They know that a body of cavalry does not wander aimlessly across country, but it quits one point to establish itself somewhere else. The question then for the cavalry commander is to decide in a given zone what these points are, what routes are likely to be followed, and then to examine some, hold others, and neglect the rest.

We ought to congratulate our commanders, like the French do, when a minimum number of men have been employed on the above duties.

82. The cavalry regulations lay down that the division must be trained to deploy for attack from any formation including column of route; but, as a rule, from the "preparatory" formation in the form of a double *echelon*, the leading line in brigade mass, in line of squadron columns or line of masses at deploying interval, the other two lines each in mass or column of masses following in *echelon* on either flank at 200 yards distance and outflanking the leading brigade by 50 to 100 yards. The batteries to move in the vicinity of the division whenever the ground offers most advantages: as a rule, either on a flank or in rear of the

leading brigade. The following "preparatory" formation might be employed with great advantage as an alternative one.

1st Brigade.



The leading brigade destined to form the first line in line of regimental masses; the other two brigades following (as shown) in column of regimental masses. The batteries on one flank nearly level with leading line with escort on their flank.

Half a squadron (two troops) of the rear regiment, next the guns, detailed as artillery escort, two squadrons of the same regiment as advanced guard, and one squadron as direct support (succour squadron) to the first line.

There seems to be considerable advantage derived from retaining each brigade in mass, as long as possible, and then deploying into line, *viz* :—

(1) The whole line starts at once in the true direction of the enemy, and has simply to go straight forward without any deviation.

(2) In mass the Brigadier has his brigades more effectually under control until the last moment, and can alter its direction more quickly and then deploy so as to hit the enemy, than if the brigade were in line of squadron columns at deploying interval.

(3) A line formed from mass seems to have more cohesion, and less wide intervals than one formed from a line of squadron columns, which has probably changed direction more than once during the advance.

(4) In the case of an indifferently drilled brigade, which cannot gallop in line, for any great distance, without gaps occurring and order being lost, by deploying from mass at the last moment these difficulties are obviated, and the whole brigade is literally flung in a knot at the enemy against that point where it can produce most effect.

83. Many of the participators in and lookers on at the camps-of-exercise that have been held of late years for the instruction of Cavalry and Horse Artillery, will doubtless have been struck by two facts in the action of the latter, *viz.*—
(1) the small number of rounds fired before the shock;
(2) that sometimes the guns were in the line of advance of the Reserve Brigade: neither of which was in any way due to any shortcoming on the part of the Horse Artillery, but solely to its position during the

Position of Horse
Artillery in the "At-
tack."

preparatory movements, for which the writer will endeavour to put forward a remedy.

Our regulations lay down that each of the brigades reconnoitring and screening the advance of a division covering an army should be accompanied by its battery: and that on notice of the vicinity being given, the division is collected, the "preparatory formation" assumed, and the guns follow in rear of the centre of the leading brigade.

It must be remembered that the number of horses in the team of a 12-pounder gun is now the same as it was in the case of the 9-pounder muzzle-loader, while the weight of the former has slightly increased; an increase in the number of horses may be considered to be put out of count, on account of the larger amount of supply required, the larger extent of ground taken up on the line of march, and last though not least the larger target offered by the teams under present conditions of fighting.

The systematic training of larger bodies has, moreover, given to cavalry a greater mobility and quickness in manœuvre, so that the net result to Horse Artillery is that they have got a heavier gun to drag and to advance to and clear the front of cavalry, which moves quicker in larger bodies than it did formerly.

As the 12-pounder breech-loader is said to be the best gun in the world, we cannot try to propose anything that would deprive us of that and its continued use,

therefore forms the basis of the following considerations:—

The fact that it is no longer considered a sign of usefulness for guns to fire the second the trail touches the ground, but that it is recognized that the gun must be laid and aim taken, shows still more the necessity for guns to be able to get well to the front for their fire to be effective and to properly fulfil their mission.

The pace of cavalry galloping to the attack, from the commencement of the gallop, to the point at which the pace begins to increase previous to the shock, has been taken at 15 miles an hour, which has been recommended as the pace of gallop of manœuvre in place of the regulation 12 miles an hour: and the pace of artillery, when ordered to the front, has been assumed at 18 miles an hour, which could be kept up probably for a mile, if the ground was hard and the going good, though if the ground was heavy through sand or rain, the pace that guns can go relatively to what cavalry can keep up decreases, and consequently 18 miles an hour would be excessive even for one mile, and therefore the guns would have less time even to clear the front of the division.

To show how much this was recognized, it is only necessary to state that at the last cavalry camp-of-exercise, the guns, instead of following the leading brigade (in the preparatory formation) in line, were formed in column of sections one battery in the centre squadron column interval, with the leading horses of

the leading sections level in the front ranks, whence they issued straight to the front and then having got a certain distance turned off towards the right or left front as ordered. This caused an improvement as it made the starting point for the guns at least 150 yards nearer the cavalry, but it can be shown mathematically by the aid of figures that even from this position the guns cannot get sufficiently far to the front and flanks to fire effectively before the shock.

The guns are heavy, but so good that they cannot be changed; and it does not seem possible to add more horses to the team (and if they were added, it is doubtful if they would go appreciably faster for a short distance), hence the only remedy lies in a change of position for the start of the guns.

The front of a division advancing against an enemy is always covered by reconnoitring squadrons, some miles ahead, while the divisional commander and his staff are usually about "half a mile" in front of the first line, before he gets his information enabling him to decide which is his protected flank, where the guns are to go. "This position" seems that most suited to the guns, which are protected by squadrons ahead, and no small bodies of the enemy would be so venturesome as to attack with a division advancing only half a mile off. From here also they would be able to get to the front and flanks owing to their start, and would have some reasonable time in which to shoot, and would also be somewhere near the place where the shock would occur, and not away in rear and only able to fire to the front.

Since writing the above, I have seen in the *Revue Scientifique* that this question has been discussed in France much on these lines and the Editor, although he agrees with the reasoning in the main, remarks epigrammatically that guns behind the first line "certainly," and some distance in front "probably," would be of no use, and is content so to dismiss the subject. We, however, have already gone a step further and bring the guns level with the front rank of the first line ; and, it is to be hoped, will push them still further forward.

84. In the German and English Cavalry the principle has been accepted that victory will be decided in a combat by the success of the first line. It is consequently laid down as a general rule, that at least half the squadrons of a brigade or division should be in the first line, and we are to stand or fall by their direct action. The Germans are proposing, logically enough, to eliminate all echelon and half-column movements from their Drill Book, for evidently these formations are not in accordance with the principle given above. An echelon is a deep formation, and expresses the idea that it is the last line and not the first which should decide the battle. The two ideas are evidently diametrically opposed. As we have adopted the German notion of long and strong first lines, there will be many who, again as in the past, will cry out that we must imitate them. All cavalymen, however, are agreed that the result of an action, given tolerable equality of numbers, is decided by the last formed-body of *sufficient*

Formations for "Attack."

size which can be sent into it. A very small, comparatively insignificant, formed-body acting on the flanks of disordered masses will produce a decisive result. It is then necessary in addition to have another formed-body to launch in pursuit, while the troops engaged are rallied. If this is not available, the pursuers must be rallied and the pursued are left free to rally and retreat, and no decisive result is obtained. The Germans and ourselves propose to attain the object by making the first line as strong as possible, and relying on it for success. The French, on the other hand, with the same aim in view, believe in a succession of lines and rely for success on having the last formed-body in hand. Is it not possible they are right ?

It is evident that where the numbers are nearly equal, the commander who makes it his aim to keep out of action till the decisive moment as large a body of formed-troops as possible, will be weaker in the first line than his adversary who makes his first line as strong as possible. To take first the case of a squadron. The Germans and ourselves lay down that a squadron should charge in one line. Going on the other principle we should have three troops in line and one troop about 100 yards in rear of either the right or left flank as the squadron commander directs, in accordance with his plan of attack. If the reserve troop is on the right, he will so lead his squadron as to slightly outflank his adversary's right if possible, and at any rate so as not to be outflanked on his own left. This is not too much to ask, for it demands no more than equally skilful leading. The enemy's left troop is then *en l'air*, and will, by making a half wheel, or probably by the

individual action of the men, fall on the flank of the three troops. Possibly some of the men and the troop leader may attack the reserve troop. If they do they will be out of order, conscious of numerical inferiority, and must be hurled back. Bearing in mind the axiom that the last formed-body decides the action, we think victory would be gained by the onfall of the reserve troop. The more the other three troops are pushed back the more exposed become the flank and rear of the enemy.

With a regiment the case is not different. The Germans say that a regiment (four squadrons) should not form a second line, though defensive and offensive flanks are recommended. Here let us have the same tactics as before. Our leader must so lead as not to be outflanked on one side, while he has his second line on the other. The Germans will have their regiment in line with an offensive troop or two troops on their left, say, and a defensive flank of the same strength on their right. To meet this we should have two squadrons in the first line opposite the enemy's offensive flank, with a defensive flank on this side; one squadron in echelon as second line on the left and 100 yards from the first line, and one squadron in echelon on the left again in squadron column at the same distance. Anyone can draw this to scale roughly. The first line should be led into action by the 2nd-in-command, and the commandant should be on the left of the second line. We believe that the combat would be decided on exactly the same lines as that of the squadron and for the same reasons, namely, that the squadrons *en l'air* will charge with their line, and, especially if they adopt the

German practice of "boiling up" the pace of the charge, will be hopelessly out of hand before they meet the second and third lines. The final intervention of one troop at most from the reserve squadron would decide this combat, and then the commandant has still three troops to launch in pursuit while his regiment rallies. We do not, of course, wish to be understood as laying down rules for cavalry combats. That would be impossible; circumstances, tactical situation and morale will have more to say to the result than anything else; but there must be general principles. Here two opposite principles are in conflict, and so may their supporters be at any moment. We have given some reasons for questioning whether that adopted by our own cavalry is the best.

In combats where more than one regiment is engaged on either side, the question is complicated by the presence of horse artillery on one or both sides. But we believe the same general principles will hold good. The only cavalry brigades with horse artillery that Indian cavalry will be called on to meet are Russian, and one may therefore pass at once to consider cases of encounters between Russian and Indian cavalry brigades. The Russian regulations are the same as the German, and lay down a very strong first line, and the charge to be sounded at 300 paces from the enemy, "so as to get the fullest speed at the moment of the shock." This, in practice, will be the fullest speed of the fastest and strongest horses. The slow, the weak, the tired horses will be left behind, and only a very ragged line will reach the enemy. It is also necessary to premise that a Russian regiment has 6 squadrons, a brigade 12

squadrons, and a division 24 squadrons; while an Indian regiment has 4 squadrons, a brigade 12, and a division 24. Each brigade has a battery of horse artillery attached to it.

We see that the Russians rely on the moral effect of the longer line charging at speed. It is absolutely necessary to have a clear idea of how the longer line is to produce its effect. It is evident that if both lines go on to the shock, and if one of them outflanks the other on one flank by two or three squadrons, these squadrons have nothing in front of them. If then the long line is to produce its effect on the short one, these two squadrons must wheel, and to produce real effect must come right round on the rear of the *mêlée*. Obviously this would be a very long operation, even if it were practicable for cavalry, which it certainly is not. The charge having been sounded at 300 paces, *i.e.*, 150 to 200 paces before the first lines meet, such a wheel would be impossible. These squadrons then will go on in part to meet formed-bodies in rear. It will only be in part, because the squadron nearest the *mêlée* will be attacked by it, and many men will try to pull up and turn aside into it. After going another 200 paces or so these formed-bodies will be encountered. That is, the outflanking squadrons will have charged at speed for more than 300 yards, and it is not difficult to picture the state of disorder in which they will be by that time. Obviously any manœuvring or leadership would be impossible.

We can now proceed to describe the probable course of a combat, and a formation in which effectively to oppose this long first line, bearing in mind the

composition of the opposing forces. The enemy's brigade has six squadrons in first line; at any rate a very long line is visible. It will not be possible at a distance to make out the formation, or how many squadrons are in first, and how many in second line; but knowing their tactics, when a long line is seen we may presume it to be six squadrons in first line, and three in second, with three in reserve. If the guns are in action on our left front against the enemy's artillery we refuse the left flank of our cavalry, leaving room between it and the guns to deploy our third line of four squadrons. We put one regiment (four squadrons) in the first line against the adversary's six squadrons, the right of our regiment against the left of theirs, with one of its squadrons following on the left in echelon at about 100 yards distance. Our second line, three squadrons, moves offensively in echelon or half-column of squadrons or column of troops, out to the right against the enemy's second line, and endeavours to outflank it. The fourth squadron of the regiment forming second line is intermediate between the first and third lines. The third line is a regiment of four squadrons in mass. The encounter takes place. On the right of the first line a stationary *mêlée* ensues. And the same may occur between the two second lines if both sides have "boiled up" the pace. If our squadrons have not got out of a steady gallop while the enemy's charge sounded at 300 paces, our men ought to have the better of this combat. Meanwhile our first line of three squadrons is outflanked on the left and about a squadron and a half of the enemy attempt to pull up and fall on their flank and rear. As they are doing so the squadron held back in echelon attacks them in flank, and the impetus of this formed-body causes

the mass of horsemen to retire. The remainder of the opposing first line, about a squadron and a half, gallops on, by this time in great disorder, and soon meets with the fourth squadron of the second line regiment. This will be quite sufficient, even if there were not close at hand the reserve of squadrons. At this moment therefore the enemy's first and second lines should be in retreat, and all but three of their squadrons are engaged. On our side four and perhaps five remain at the disposal of the brigade commander. But the foreign commander, seeing the mass of horsemen sweeping past his left flank, and believing that success depends on the success of the first line, now sends at least one of his squadrons on the flank of the pursuers, and so leaves himself with only two, which now see a line of four or five squadrons advancing on them, while they know that they are unsupported, and are shaken by the defeat of the first and second lines. The result is evident. There is advantage in keeping the third line in mass as long as possible. The men are more in hand, and the commander can launch into the fight just as much force as he judges necessary.

We have intentionally not alluded to the action of the horse artillery. The batteries on either side have galloped to the front, and each impelled by the importance of coming first into action, have done so nearly simultaneously as soon as about 2,000 yards separates them. The cavalry meanwhile approaches. It should be one object of our commander to advance at so moderate a pace, a walk if necessary, that the first lines shall meet if possible not more than 400 or 500 yards in advance of the alignment of his guns. If his first

line commences its rapid advance beyond the alignment of the guns when the enemy's first line is about 1,200 yards distant, this object will be attained. This leaves the field of battle open to our guns up to the last moment, and also masks our own first and second lines to some extent from the hostile artillery. It also saves the horses. The echelon formation advocated for the first line conduces to the same object.

Our regulations advocate an outward manœuvre of the first and second lines, from the guns, with the object of making the enemy bring up his shoulder towards our guns and expose himself while masking us. But this denies to the enemy equally skilful leadership. We can only manœuvre in this manner in long columns intending to wheel into line and attack. A commander of any skill, the moment the movement is pronounced, will manœuvre in the same direction in column across the heads of our columns. He also can wheel into line at any moment, and we must either form to the front or half-front of our columns, or wheel into line and bring up our shoulders to meet him. We then find ourselves in the very position we intended to put him into, namely, with our line exposed to enfilade from his guns, while we mask his line from our own. Anyone can verify this by drawing it to scale. He will see that the enemy will always have the shorter distance to travel. Such manœuvres are dangerous against equally mobile, equally well-led troops, and therefore we have made our first and second lines move straight to their front in the instance given above.

We believe then that the combat of cavalry or, for the matter of that of any troops, is decided by the

commander who holds the last reserves. It is a principle of war accepted implicitly by soldiers, but it seems to have been rather lost sight of in our cavalry regulations.

MACHINE-GUNS WITH CAVALRY.

The following notes on the above by Captain W. Anstruther Thomson, Royal Horse Guards, are most interesting and instructive:—

85. It has sometimes been suggested that machine-guns should form part of a battery of artillery, but this idea has wisely been ignored, for although they might sometimes be so employed, especially as a safeguard against cavalry attack, the true rôle of the machine-gun is in independent action.

The value of machine-guns for purposes of defence is generally admitted among nations; but as our Cavalry Drill Book so ably points out these weapons, can do far more than this, and there is now no doubt that, in taking part in a vigorous offence, reliable machine-guns will prove invaluable.

Let them push forward with the first line, if possible, where they may find cover, and dash out, as opportunity occurs, and take the enemy by surprise. A hedge, a hay-rick, a cottage, a lump of trees, or even a heap of stones, will often furnish a hiding-place for the occasion.

The gun presents so small a target, it is so easily concealed, it is so quick, so mobile, and so deadly, that when properly handled it should rarely be captured or put out of action. Now and again, no doubt, one will be lost, but these dogs bite and men and horses will

think twice before attacking them, except under the most favourable circumstances ; and if they serve their purpose it may pay to sacrifice them. It is easy to render them useless to the enemy : to carry away or hide the lock, or feed block, to jump the bore, or to knock off the sight, would be work of a moment. It is even possible to unhitch the gun itself and carry it off in one's arms for a few hundred yards, or otherwise to disable it ; but a clean pair of heels will generally obviate that necessity.

Except when it is desirable to hide it, the cavalry machine-gun is of no use galloping behind the centre squadron of the regiment ; it should be away on the flank where it can best get a chance of manœuvring with effect ; it is only in the way as a serrefile.

The gun commander must keep his eyes open ; he must watch the enemy, and watch the ground, and watch his own force too. He must keep his line of retreat secure, if possible, and not allow himself to be taken in flank, or rear, or get too far away from succour. He must choose his positions well, and decide quick and travel quick, for it is one thing to select a position, and quite another thing to get there.

He must ever be pushing on, taking every short cut and advantage possible.

He must always be "there," but never in the way.

Cavalry machine-guns should seize every chance, not only against cavalry but against the other arms, especially artillery : to creep along a hedge, to get within range without exposure, to fire at guns, horses, and

escort, at about 1,000 yards, will be a right task for a single gun, and if war has any likeness to manœuvres, such golden opportunities will constantly recur.

There would be no waiting for an umpire then, and few would be the arguments urged against the machine-gun when it had played for half a minute at a fair target within that range.

At the same time it must be remembered that one well-directed shell will demolish the machine-gun, and it is only where sufficient cover is forthcoming that this can safely be done.

To illustrate the subject, I will now ask you to follow a machine-gun through the Idstone Manœuvres of 1893, showing the opportunities that may arise for such a weapon with cavalry in the field.

II.—IDSTONE MANŒUVRES.

Battle of 4th September.

(Map.)

Position 1.—Our cavalry division was formed up south of Bishopstone Downs, north-east of Russley Park, while the enemy's advancing infantry approached to within 1,000 yards of our entrenchments on Idstone Downs.

The cavalry division swept round and charged the infantry in flank, who at once formed groups, presenting a perfect target for the Maxim gun, as well as the artillery and infantry, on the hill overlooking them.

At about the same time a battery of the enemy's horse artillery, appearing at the west of Swinley Copse, came under Maxim fire at 1,000 yards and would have been destroyed.

Ammunition.—The 3,500 rounds laid down to be carried on the Maxim carriage would have sufficed for all this.

Remarks.—A squadron of our hussars was sent round to the right, east of Ashdown Park, and took a battery in rear.

Two squadrons were sent to the left to threaten the enemy's flank, but their attack was ineffectual.

Machine-guns with both these parties would have been of service.

Battle of 5th September.—First Phase.

Position 1.—Our brigade formed up under Fognam Clump until the order was given to attack the advancing enemy.

When our artillery took up a position to the south, on Bailey Hill, and our cavalry trotted north under cover of Kingston Down, the Maxim gun on their right rear.

Position 2.—Hearing the enemy's artillery firing to our right we galloped our gun to the brow, and opened fire at a range of 800 yards, taking them in enfilade.

The enemy's Nordenfelt, concealed at Half Moon Covert, turning its attention on us, we had to retire beyond the brow, but by this time the enemy's guns had retreated.

Here we were glad of our shield and our power of returning ten shots for every one of the Nordenfelt.

Position 3.—We then hurried after our cavalry, and arrived at the nick of time to catch two squadrons of the enemy in flank as they wheeled to the north to face the charge of one of our regiments round the old Warren Wood.

Here the battle was stopped.

Ammunition.—Ammunition would have sufficed.

Battle of 5th September.—Second Phase.

The brigade halted under cover of Hinton Down.

Position 1.—The Maxim hiding in the fir-tree strip to guard the right and front, while the artillery took up a position on the left.

Position 2.—The enemy's guns appearing at the clump north-west of Russley Park, we galloped to the *tumulus* on our left front, and there hid.

The hostile cavalry now showed itself north of Russley Park.

Position 3.—One squadron, charging to the south, came under Maxim fire at 600 yards, the gun galloping out and back so rapidly, that the enemy's artillery would have had no time to take aim at it, they were besides busily engaged in a duel with our artillery.

Positions 4 and 5.—The main body of the enemy next advanced in column, the Maxim playing on them from 1,200 to 400 yards. They charged our cavalry and

artillery on the north side of the *tumulus*, but ignored the Maxim gun, which now poured a hail of lead into their flank at 200 yards.

Position 6.—The gun, of course, ran great risk of capture, and in the end a squadron surrounded it, but a moment later “cease fire” was sounded. The end attainable was worth the risk we ran.

Ammunition.—The ammunition on the gun would have been expended, but our reserve supply would have been close at hand.

Scouts.—On this day we had but one scout, and for some time not even one, as his horse fell head over heels, clipping a piece out of the gun wheel with his hind shoe.

We might easily have been surprised at the *tumulus*, and we felt most severely the want of proper scouts. Good men, well trained and well mounted, are absolutely necessary to a machine-gun with cavalry.

Battle of 6th September.

From Old Warren, where we saw some of the enemy's scouts and a squadron of their hussars about a mile to the north-west, we galloped through Knighton Bushes on to Wellbottom Down.

Our cavalry and guns halting just below the ridge under cover from the enemy's artillery, some 1,800 yards to the north-east, who now opened fire on the cavalry whom they had just seen.

The Maxim, under cover of the ridge some 400 yards to the left, opened fire on the guns and escort for a few seconds at 1,800 yards, again withdrawing below the crest to guard our left and front from surprise.

Our brigade then wheeled to the left, trotting north towards Uffington Castle, under cover of Woodstone Down.

Our artillery taking up a position to the north of the clump, the Maxim on their right behind it.

Observing a squadron of the enemy's hussars halted west of the strip, we ran out and opened fire on them at 800 yards.

They at once took cover on the south side of the strip, while we moved so as to cover them if they emerged.

This they did, and were under Maxim fire for the space of 800 yards, within easy range.

Our cavalry had meanwhile charged the rest of the brigade which were drawn up to the right of their enemy's guns and a furious combat was raging south of Knighton Warren Farm.

The above-mentioned squadron of hussars, although theoretically slain by Maxim fire, did yeoman service to their side by taking our men in rear.

As soon as they were gone we galloped to Knighton Warren Farm, taking cover under a hay-rick, caught the enemy's artillery as they were limbering up at 800 yards.

The battle then ceased.

The position behind the clump was most favourable for the Maxim, and had it not been there, the squadron from behind the strip could have done all the execution they got credit for, and more than this had they boldly charged our guns instead of halting where they did, it is not impossible that they might have rolled the escort up and taken our guns in rear; a machine-gun on the flank will save many a day.

Ammunition would have sufficed, and reserve supply could have been at hand.

Battle of 11th September.

The Maxim took up a position behind a ragged hedge at the cross roads south-west of Uffington Camp.

A few moments later we found a contact squadron of our hussars retiring before a superior force of the enemy's cavalry. Allowing our men to approach to about 300 yards we darted from our cover and fired down the road. Our squadron drawing off to the east as soon as they observed us.

The enemy retired.

The Maxim, supported by the contact squadron, advanced, and finding a squadron of the enemy halted over the spur of Woodstone Down, greeted them with a rattling fire at 250 yards, causing them to wheel about and retire at a smart pace.

Seeing the enemy's guns on Tower Hill we galloped into the hollow east of Pingoose Covert, the Maxim creeping out of sight to the end of the strip and opening on them at 1,000 yards; our infantry meanwhile advancing on either side.

Perceiving a lot of dust over the rising ground, about 1,000 yards south-east, we galloped to the brow anticipating a charge from the enemy's cavalry on the left flank of our line, but only found a squadron.

We opened fire at 800 yards and caused them to retreat to Knighton Bushes; we now returned to the south of Pingoose Covert, and from thence galloped to Compton Bottom; here the enemy's squadron again came under the Maxim's fire, and two of their troops were put out of action.

Our infantry turning at Compton Bottom attacked the enemy's right flank, and seeing a good place among the old trees 200 yards to the west, we galloped there and poured a murderous fire on the limbering guns and retreating infantry, who now had to leave their shelter trenches.

The contact squadron had by this time left us. Here we remained until Knighton Bushes were clear, and then galloped through them, checking at the further end till a scout reported all clear beyond. We then emerged, and seeing some squadrons of the enemy halted on the hill 1,000 yards to the south, we opened fire and they retired.

We were now put out of action, having mistaken the enemy's Rifles for the Cameronians, who were on our side, a mistake which would have entailed our speedy demolition.

After an enforced halt of 10 minutes we made a fresh start, and climbed on to Kingston Down. Keeping under cover, as far as possible, till we reached the

shelter of the Rubbing House ; here finding the enemy's infantry with a Nordenfolt in front of us, we opened fire at 400 yards.

Our infantry advancing as the enemy retired, at length reached the foot of the Down when the guards were attacked by a squadron, and a few moments later the whole line was charged by the enemy's cavalry brigade.

The Maxim and guns on the slope of the hill playing on them from 1,000 to 400 yards distance.

Few could have escaped the combined fire of artillery, infantry, and machine-guns.

Our force then advanced across the valley to attack the guns on Bailey Hill, the Maxim hiding under cover of Fognam Clump till a fresh opportunity should arise.

Here the battle ceased.

Ammunition would have been a difficulty in this battle, as we should have expended our allowance many times over, but there was nothing to prevent a fresh supply following in rear of our army.

Had the contact squadron remained with us we should probably have been saved the blunder that put us out of action, and the Rifles would have afforded a grand opportunity for a cavalry charge from the wood, and an excellent target for the Maxim when they formed square.

Battle of 12th September.

We were escorting a convoy, proceeding to Lam-bourne *viâ* the Icknield way and south to the west of Ashdown.

Our advance guard, a squadron of hussars, accompanied by the Maxim, pushed forward along the Icknield way to within 400 yards of Ashbury Folly, when a squadron of the enemy was found advancing towards them.

The Maxim at once galloped forward and opened fire at 400 yards, upon which the enemy took shelter under some farm buildings on their left.

We then observed from the cover of the hedge the whole brigade of the enemy's cavalry advancing at a walk 800 yards to our left. We at once opened fire and played upon them until they were out of sight, but no notice was taken of us.

The hostile guns now appearing on Tower Hill we retired to a position on the right of our artillery, where we found cover under a hedge and bank alongside of the mounted infantry.

Our cavalry was in rear of the clump and the convoy half a mile to the north under cover of the hill.

The enemy's cavalry charged our guns under fire of the mounted infantry, and the Maxim from 1,200 to 300 yards, were then met by our cavalry, with the result that some of the enemy were put out of action.

Our cavalry then moved to the left to attack the guns on Tower Hill. The Maxim dashing forward to Odstone Barn to support them, opened fire on the enemy's guns at 1,000 yards, our mounted infantry following in reserve

We then galloped to Down Folly, firing again on the guns at 600 yards.

Thus ended the first phase of the battle.

The convoy proceeded along the Icknield way, turning to the south by the track leading to Red Barn. The Maxim being in rear, expecting an attack from that quarter. As we left the Icknield way the enemy's guns opened on us, but on reaching the cover of Red Barn, the Maxim came into action, and returned their fire at 800 yards.

Two squadrons of the enemy's hussars threatened our left from the north of Hayley Wood. We opened fire on them, but observing two of our regiments wheel about unseen by them, we tried to entice them on trotting a little way and halting, pretending to be in trouble; thinking us an easy prey, they charged round the wood and were caught by our two regiments in front, and the mounted infantry at Red Barn in the rear. They were put out of action.

The attack in rear having been disposed of, the Maxim trotted on in advance, expecting work in front.

Arrived at King Alfred's Camp, we applied for a field troop as escort to help us to secure the road between Ashdown and Upper Wood.

Instead of a troop, two squadrons came with us, and the gun secured the road, but a rumour of an enemy's squadron over the hill to the south took the two squadrons away, and the Maxim unwillingly accompanied them.

There was no enemy there, and as we hurried back we saw the dust rising on the road we had left, proving that we were too late. The enemy's brigade now emerged.

Hoping that they would attack the convoy, and that we should get them in rear, we remained out of sight over the brow of the hill; but they discovered, and two squadrons attacked us, forming a splendid target for the Maxim gun as they charged up the hill. We should have demolished a lot of them, although we were lost ourselves.

We were put out of action with a field troop of the enemy slain by the Maxim gun.

The ammunition on the gun would have been expended, in the first phase of the battle, but reserve supplies would have accompanied the convoy.

Battle of 13th September.

Arriving at the rendezvous at Fognam Clump, we found the enemy holding Idstone Down. Our infantry advanced to the attack on both sides of Bottley Copse. Our artillery opening fire from Bailey Hill, our cavalry remaining under cover of Upper Wood.

The Maxim galloped to a position under cover at the east of Bottley Copse opening fire on two of the enemy's squadrons on the move at about 500 yards.

On our infantry machine-guns coming to this position, we moved lest we should attract artillery fire, and from the wall on the west of the copse opened fire on the enemy's infantry at 800 yards.

So soon as the hill was clear we galloped to the brow and caught the last line of retiring infantry in enfilade at 300 yards. Keeping the gun as much as possible under the hill, the muzzle only showing.

Finding further advance on the glaxis impossible, we galloped under cover of the Down to Three Barrows, where we found shelter, and fired on the enemy at 1,000 yards.

We next advanced to a *tumulus* 500 yards west of Harley Bushes, firing at retreating infantry and a squadron of cavalry at 600 yards: and then galloping on to One o'Clock Hill Clump we got a good chance at the infantry, on Two o'Clock Hill, at 900 yards.

Finally, on to Two o'Clock Hill, when our advance was stopped, to allow the hard-pressed foe to retire to Lamby Down.

The ground did not admit of further advance until Lamby Down was clear, but we had observed a squadron of cavalry on the right flank, and they now were halted at Starveall Farm; we were about to make an attack on them when "cease fire" sounded.

Here we were drawn into the infantry fight right away from our cavalry brigade, who eventually had a combat of its own on Hinton Down.

But we had left them halted at Upper Wood and had been hard at work the whole time. Unless specially ordered, it would have been folly to remain idle, while there was good work and good cover for us at the front.

This day showed me how useful fast machine-guns might be in an infantry fight on suitable ground, keeping under cover, galloping everywhere, popping up at unexpected places, and often securing the flank against attack from cavalry.

Ammunition would have been expended many times over, but reserve supplies could have followed us in rear.

In an infantry fight I believe there would often be time to gallop back and re-fill the ammunition boxes, but perhaps this manœuvre would be attributed to cowardice. With cavalry, however, this could seldom be done.

It was on this day that the enemy's cavalry Nordenfelt was captured by three or four of our hussars.

Battle of 14th September.

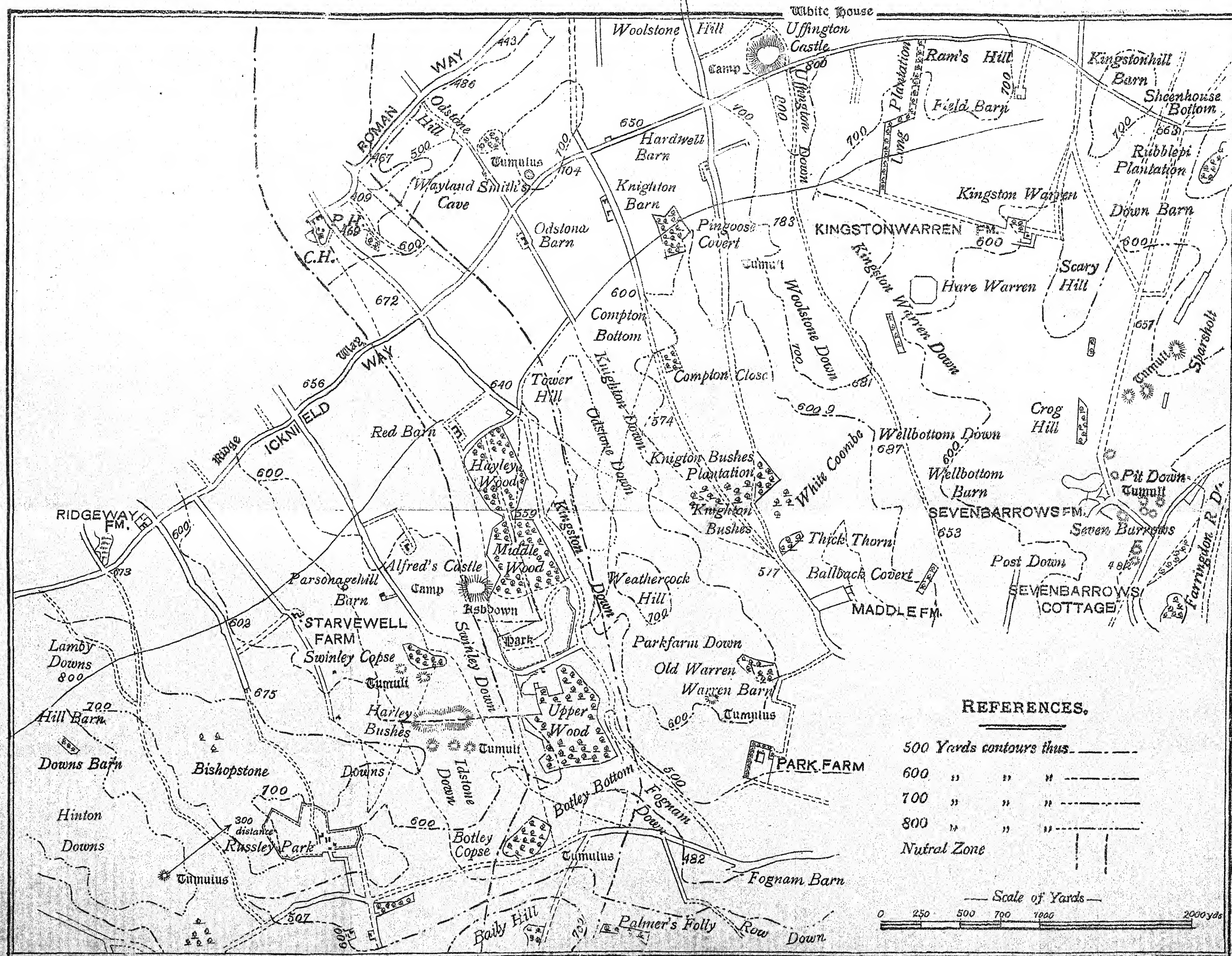
We were to defend the rear of an army retiring on Uffington Castle.

An infantry and artillery fight was taking place to the west, for the possession of Idstone Hill; our cavalry brigade was in reserve under cover of Red Barn; our horse artillery, with a mounted infantry escort, at King Alfred's Camp, while a party of mounted infantry was sent to Swinley Copse, to line the hedge to the west of them.

The Maxim halted behind a convenient hay-stack till affairs developed.

After a long wait, we observed that a party of the enemy's horse, about a squadron and a half, had approached to Starveall Farm, and were halted there

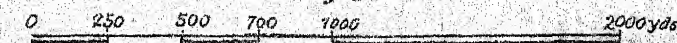
ODSTONE MANŒUVRES.

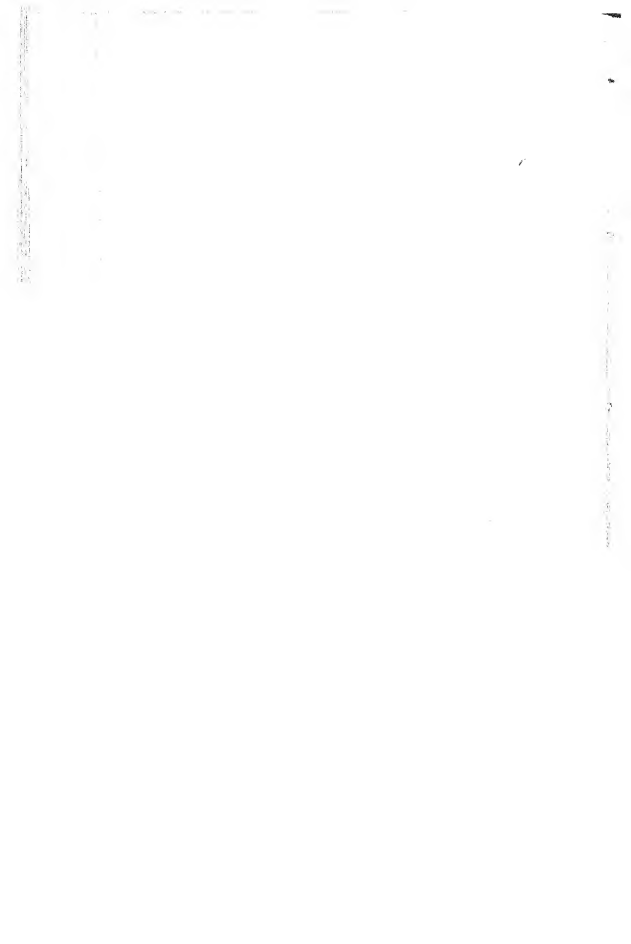


REFERENCES.

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Neutral Zone	

Scale of Yards





under cover from our guns. We at once galloped to the best position we could find, and opened fire on them at 1,200 yards, and then, as this position was exposed to the enemy's shells, we took cover at King Alfred's Camp.

The enemy's party then emerged from Starveall Farm, making a sweeping charge to the north-east, presumably with a view of taking our guns.

The Maxim galloped out from behind King Alfred's Camp, opening on them from 800 to 400 yards.

The mounted infantry at the same time giving them a succession of volleys; they sought shelter at Parsonagehill Barn, but were put out of action. "Cease fire" then sounded.

This was the only piece of cavalry work that took place on that day, beyond a few mounted infantry being put out of action; and it was the last affair in which the Maxim took part.

I may add that during these manœuvres we had, on one occasion, six men hauling on to ropes to keep the gun from capsizing, and frequently we had three men pulling behind, as a drag downhill.

The gun never had to turn back from an obstacle during manœuvres, though of course we had to choose our places, and sometimes take the horses out to save the strain on our harness.

The same horses came out every day, and did a 37-mile march to wind up with, without being sick or sorry.

The Gun on Service.

The following details from Matabeleland, I have learned from an eye-witness:—At the battle of 1st November, which took place in the afternoon, the Matabeles charged to within 140 yards distance of the laager, when the rush was stopped by Maxim fire.

At the battle of the Shangani, 24th October, which was fought in the dusk, the nearest natives killed were but 50 yards from the Maxim.

Most of the enemy were killed by the machine-guns, their fire being steadier than that of the rifles, and the range easier to discern. The killed were mostly struck by bullets in two or three places.

The guns were fired by cool, experienced men, the late Captain Lendy and Lieutenant Llewellyn (late R.N.) were the firers of two of them.

To this point I attach great importance, the firer must be an intelligent and steady man, who knows how to handle his weapon, and what to do if it jams, and the best means of preventing this casualty. Such a man is well worth a shield to protect him.

Lieutenant Llewellyn's gun was driven in a carriage drawn by four mules. Captain Lendy's gun was carried on horseback; he brought his gun into action in 60 seconds.

In the Victoria Column the machine-guns were on carts drawn by six horses, and with drivers.

A pack-saddle for bush work proved a tremendous saving.

I have here a letter from an officer who took part in the Matabele campaign, extracts of which may be of interest:—

“With regard to the Maxims, I am perfectly certain that the best method of carrying them is on galloping carriages with a tripod in the net behind, so that they can be moved to any point *at once*.

“Even with infantry, I should have them on galloping carriages; they are on a higher level, and command a greater frontal fire, and can be brought to any point *at once*, and they could be left on an eminence to fire over the heads of advancing infantry, and *then* brought up again at a gallop.

“You should, I think, have two Maxims on a given face so that there is no cessation of fire whilst belts are being changed or from other causes.

“They can be used up to a very long range, and were used by us up to 2,000 yards with deadly effect upon natives retreating along the sky-line, the distance being found by firing two single shells from a 7-pounder.

“They are equally deadly at close quarters, and did *great* execution at 400 and 500 yards, and even closer, on any body of natives attempting to mass.

“In fact, it was perfectly *impossible* for them to do so, no matter what bravery they might have shown.

“At the same time you must remember we were also under a hot fire from the enemy.

"I deprecate the large detachment we have in the service ; let the men be trained by all means, but there is ample about the gun.

"The gun should be left to the man firing it. Do not let him be harassed by orders. Let him use his own common sense; the gun will be worked better and the men have more confidence.

"We had no one about the guns except three men, and it was extraordinary the way they worked them, ceasing fire when they saw that it had been effectual and turning it on to another point where it was most required.

"Each man was thoroughly up in the mechanism of the gun, and could put it to rights whatever happened.

"We had spare locks and everything ready, but *they never jammed once.*

"We placed the guns a little outside the laager, with a circle of thorn-bush, about 15 feet broad, round them, so that by slewing round the trail you could flank any side of the laager ; it was, in fact, a square fort with a

lunette at each corner.



"The moral effect of the Maxim I consider great, the continuous firing which can be heard above everything, gives the greatest confidence to the men, and you can imagine the effect on troops of a hail of bullets pouring on to them without cessation.

"I think it advisable not to reserve the fire of Maxims until the enemy is at close quarters, but begin at, say, 1,500 yards.

"The effect would be very striking on advancing troops, especially if you kept the gun working on the traverse. The great thing about them is the continuous stream of bullets.

"Such an amount of lead can be put in during the most rapid advance, that it is my own belief not even the best troops in the world could advance against three or four Maxims well served."

I may add that Sir John Willoughby, who was Chief of the Staff, mentions in his despatches that the Maxim did good service at 2,000 yards, and I have it on the authority of the High Commissioner, Sir Henry Loch, that they would never have been able to keep the Matabele at a distance without the Maxim guns.

Mr. Selous, who has just returned, bears witness also to the immense utility of the cavalry machine-guns in Matabele land.

III.—MATERIEL.

A.—Transport.

Having followed the gun in manœuvres and in action, let us now turn our attention to the vexed questions of *matériel* and *personnel*, upon which such varied opinions are held, avoiding, with your permission, uninteresting mechanical details.

From experience at the above manœuvres and elsewhere, I am led to certain conclusions which I will, with all due deference, put before you.

Transport of the Gun.—In the paper read at the Royal United Service Institution by Captain Benson, R.A., in November 1887, and in that read at Aldershot by Captain Stone, R.A., in July 1888, and in the discussions which followed, this subject was well threshed out; but, although five years have elapsed since then, very little has been practically done towards the solution of the question, which I maintain can only be solved by practice in the field. Personally I would like to see experiments tried with a four-wheeled buggy on hickory wheels, somewhat of the buckboard type. It is important to keep the carriage from being top-heavy, and I should mount the gun with a small shield to protect the firer close to the rear axle, so that it could be fired with the least possible vibration, with the horses in, if necessary, though they should be taken out whenever it is safe to do so; but in cavalry work this can seldom be done, for though it takes but a few seconds to take them out or put them in, it is the seconds that make all the difference.

While on this subject I would like to point out a carriage designed by the Maxim-Nordenfelt Company for a 3-lb. quick-firing gun firing 15 aimed shots a minute.

The horses to be driven three abreast like the Russian troika.

I cannot here enter into the question of quick-firing guns with cavalry, it is beyond the sphere of this lecture; but I think that I may safely say that these are the weapons most to be dreaded by machine-guns on service.

I have here two cartridges—common shell and shrapnel—designed for the 3-lb., and carrying 45 bullets, case-shot containing 108 bullets, but I think a larger calibre, such as a 6-lb., would be far preferable.

But to return to our subject, I must say that from personal experience I have great respect for a cart of the buckboard type, having been taken over places in them, in the Australian bush, that I had deemed quite impassible; and I expect that there are many officers here who, having travelled in America and Australia and elsewhere, know how much can be done over rough country, in a four-wheeled buggy heavily laden, and not always with the best broken horses. At the same time it must be remembered that wheels will not go everywhere, and I am strongly in favour of having a pack-saddle and tripod handy in case of need.

The Cape Mounted Rifles have adopted this suggestion, and a pack-saddle is to accompany every Maxim.

The saddle they adopted is Captain Newburgh Stewart's, which is fashioned with a hinged tree, somewhat on a similar principle to the Austrian saddle, which has come as a blessing to cavalry, and was introduced into this country by General Keith Fraser.

Another saddle which appears to me well suited to the purpose is that invented by General Bogle; it has the great advantage of counteracting the deadweight of the load by means of a kind of cradle and four springs, the weight being distributed over the whole horse's back, instead of having all the pressure on the top.

I have seen a horse with Gardiner gun tripod and 300 rounds of ammunition jump 4 feet high in this saddle, and it takes but 10 seconds to come into action and about 20 to replace the gun on horseback.

It is adopted for carrying ammunition and other baggage as well.

Through the courtesy of the above-named gentlemen both these saddles are here for your inspection.

At least one ammunition horse would, of course, accompany every pack-saddle gun with a load of 2,000 rounds.

Light entrenching tools should always be carried with the gun, whether on horseback or on wheels; a few strokes with axe or spade will often enable the carriage to cross an obstacle that otherwise would be impassible, and a hasty entrenchment might sometimes be of use.

As regards harness, I believe that we might get some useful hints from the fire brigades of different countries, but the harness invented by Major Baden-Powell, and adopted by the Government, enables the horses to be taken out or put into the carriage in 10 seconds, and this will be hard to beat.

B.—Ammunition.

It is laid down that the Maxim gun should carry 3,500 rounds Martini-Henry bore on the carriage, and 7,200 in the ammunition cart; the whole amount should, of course, be carried in belts, while the Nordenfelt carries 2,000 in boxes. The introduction of the .303 bore will enable us to carry about half as much again.

With machine-guns it is of the utmost moment that reserve ammunition should be forthcoming when required. The expenditure is so enormous and so rapid, that unless fresh supplies are at hand the guns may find themselves out of action at the very time when they are most required.

The amount of ammunition to be expended during the fight is a matter for careful judgment and anxious thought.

It can only be solved in the field; and no amount of theory will avail, unless the gun commander can keep his wits about him and his reserve ammunition at hand. The amount of ammunition laid down for practice is quite inadequate. An annual allowance of 200 ball and 300 blank for a gun that can fire 600 shots a minute, does not admit of a fair training for either men or horses.

Smokeless powder, so long as it is satisfactory and does not destroy the barrel, is all in favour of machine-guns.

We will see our target without being blinded with smoke, or our position being revealed by that cause.

The cordite .303 bore has not so far proved satisfactory in the Maxim gun, but the powders used abroad appear to answer, and I look on the remedy of these defects as only a matter of time.

C.—Range.

This is a most *important* subject, and one to be *thoroughly* considered.

At 1,000 yards it is possible to put nearly every shot on a 12-foot target, the average being 90 hits out of 100 shots on a 6 x 8 feet target.

At the same target at 2,000 yards the average is 15 per cent., but even this would admit of some 100 hits a minute, and at a squadron 9 feet high by 50 wide the percentage would be much greater.

At 1,800 to 2,000 yards, the Maxim did good service in Mashonaland, and proved itself effective beyond that range.

At distances within 1,000 yards, in the hands of expert and steady marksmen, it is deadly.

Of course, at long ranges, it will be a question whether the execution done will pay for ammunition spent.

Experiments have been made by Major East firing at a particular spot from the reverse slope of a hill. A couple of pegs in line on the brow, and a man with a telescope to signal the result of shots, being all that is necessary to carry this out in a rough and ready fashion.

A bridge or defile where the ground was favourable might be held by an unseen gun in this manner.

A range-finder should always be carried with the gun.

The Mekometre, though requiring two observers, I believe, can determine ranges with only 5 yards error up to 3,000 yards.

D.—Sights.

I advocate the introduction of orthoptic sights such as have been adopted by Major East, 1st V. B., Hants Regiment, made by Messrs. Rigby, I believe, and proving most satisfactory.

Telescopic sights might also be carried with advantage.

E.—Shield.

The shield should be as light as possible, but big enough to cover the firer and strong enough to withstand the heaviest small-arm bullet.

A steel shield of $\frac{3}{8}$ -inch thickness will answer this purpose.

There is no doubt that the average man will shoot better when he is safe, or thinks that he is safe, than when exposed, and a gun with a shield could do a lot of work under fire where an unprotected gun could not live.

Against this, of course, comes the question of weight and whether the advantage of a shield compensates for the extra strain on the horses. Myself, I think it does.

The officers who worked the Maxim in Mashonaland are all in favour of shields.

IV.—PERSONNEL.

A.—Gun Detachment.

Many are in favour of forming machine-gun detachments into separate units.

How far this might answer I cannot say, but at present the regimental system is far more likely to be adopted, because it is the most economical.

It is very improbable just now that money will be diverted from other military objects, to establish machine-gun batteries or troops.

For the present, then, I confine myself to the regimental system, which I think can work very well.

I should like to see three or four machine-guns at least to each cavalry brigade. An officer, a sergeant, and two men to each gun.

An experienced non-commissioned officer and two men with the spare ammunition, which should be carried in a similar manner to the gun.

Scouts should be permanently told off, both for the gun and spare ammunition.

When several guns accompany a brigade, an officer should be told off in charge of them, lest they should all be on one flank and in each other's way, but a wide latitude as to movements and position must always be conceded to individual gun commanders.

B.—Scouts.

And now we come to a subject that has not been touched upon so far as I can learn in previous discussions. I refer to scouts.

As with cavalry so with machine-guns, the great chance of success is in surprise, and the chief risk of failure lies in being surprised. It is therefore of the utmost importance to have good scouts, four at least for each gun and two for each ammunition cart.

Cavalry leaders are naturally adverse to weakening their squadrons; but I ask you—is it not worth while to take a man out of the rear rank of each squadron, rather than to cripple the whole offensive advantage of a weapon which, if properly handled, may decimate a whole brigade?

Though it would be folly to gallop blindly forward, in an unknown country, without scouts. for ground or enemy, it is by pushing forward, not foolishly but boldly, that the gun will make its name.

C.—Escort.

Except under certain conditions an escort is a great advantage. It makes a man bold; the knowledge that it will follow and look after the detachment takes away half the anxiety of the machine-gun commander.

Without an escort he has to be ever looking round.

Where is the main body?

What is their object?

How can we get there ?

Shall we be in the way ?

are questions that constantly crop up, and though, of course, they must be borne in mind, they should not be allowed to bar the road to enterprise, and a field troop, as escort, would solve the question.

Again, the presence of a troop will tend to keep the enemy's cavalry from scattering, and so offer a better target to the gun ; this would also apply to infantry, besides preventing the risk of capture from single horsemen galloping in from opposite directions.

On occasions, when the escort is not required, it could rejoin its squadron.

V.—FOREIGN PROGRESS.

The following notes I have obtained from foreign military journals :—

In Switzerland there is to be a Mitrailleuse section incorporated in each cavalry regiment, consisting of—

1 officer,	} to 3 Maxim guns ;
1 sergeant,	
1 armourer-sergeant,	
3 corporals,	
12 men,	
2 drivers,	

- 4 horses to draw the ammunition wagon on which the guns are carried on the march ;
- 19 riding horses ;
- 6 pack-saddle horses, *i.e.*, 3 for the guns and 3 for the ammunition, the latter carrying 2,000 rounds apiece.

These pack-horses are led by mounted men, who have a stick instead of a leading-rein to prevent their knees being crushed by ammunition boxes or gun.

They are never to be used singly, but to support one another.

Before taking the field the gun commander will obtain his Chief's instructions, and will conform to the best of his ability.

The gun detachment will, as a rule, follow in the rear of the regiment, but in the attack will take up a position in rear that the cavalry, if beaten, may rally round them. (While we examine these tactics we must remember the mountainous nature of the country.)

These guns will be most useful in enabling cavalry to hold an extensive line of front along a river or mountain range, a few machine-guns being placed at the points of passage accompanied by weak cavalry detachments quite independent of the remainder of the cavalry.

At night machine-guns will be allotted to outposts and pickets.

My authority proceeds to say, that no cavalry leader is to be influenced by the machine-guns, nor is a single trooper's life to be sacrificed for them.

They are to be looked upon only as a welcome auxiliary to cavalry, never as the principal arm.

Whenever it is necessary, in order to rescue troops, the machine-guns are to be sacrificed.

The moment that cavalry has to cover machine-guns it ceases to be cavalry.

There are 24 Mitrailleuses or Maxims required for the Swiss cavalry and 8 wagons.

The Maxim is carried with the tripod on one horse and 2,000 rounds on another, its calibre is 7.5 m. m. or .295 bore.

Eight thousand rounds are carried in the wagon for every gun.

Ten thousand pounds has been voted for this purpose; 4,000*l.* of which is to be spent this year.

The Austrians, though they have not as yet adopted machine-guns for field service, admit the necessity of supporting cavalry regiments with infantry fire, since, in their last manœuvres, 1893, they attached two battalions of rifles to each cavalry division, which, in spite of brilliant marching, necessitated to some degree the subordination of the movements of the cavalry to the riflemen.

I may mention that one battalion marched 67 miles in two days, and only 11 men fell out.

VI.—CONCLUSION.

In all the above suggestions I would ask you to bear in mind that I claim nothing for theory; practice and experience are alone the true and proper tests; and unless experiments are made all argument is in vain.

To sum up the whole matter, whether the gun is carried on horseback or on wheels, whether the detachments belong to regiments or are a unit of themselves, the same tactics will apply, and rapidity of movement is the great desideratum.

To tell the gun commander the general idea, give him as free a hand as possible, and I predict that these guns, so far from being an impediment, will be a welcome aid to cavalry. They are suitable alike for attack and defence, a useful auxiliary to every arm, and will prove themselves of value hitherto undreamt of.

As the improvement in modern firearms continues, so does the importance of supporting our cavalry with fire increase.

Here is a chance of carrying, so to speak, a battalion in our pocket.

We have proved that it can travel; we know that it can shoot. It is but a few weeks ago that it saved a British Column from defeat. One of the enemy has described its effect. In his own words he says, "It mowed us down." What is there to prevent these ominous words from being applied to the battles of the future?

SECTION V.**LONG DISTANCE MARCHES.**

86. The cavalry soldier should not only be able to ride his horse, but know exactly its powers of endurance and those of the horses belonging to the men he commands, as a guide to carrying out detached duties. Reports of long distance rides undertaken by various corps in India during the drill season 1886-87, compiled by Captain D. Dean Pitt, R.A., are most instructive on this subject, and should be studied. The following remarks by Captain Dean Pitt deserve notice :—

“ It appears to me that any preliminary training for these experimental marches is a mistake and takes away much value from the experience gained. On service the call for any body of cavalry or artillery to make a long or forced march would probably come quite suddenly, there would be no time for ‘ preliminary training,’ they would have to start off then and there and do their best. The work that cavalry and artillery go through during a drill season should be quite sufficient training. If long distance marches are to be carried out, orders limiting the rapidity of the ride should be issued. Of course, the shorter the distance the quicker in proportion can the ride be done. For instance, 60 miles in 12 hours is feasible to most horses in good condition, but 120 miles in 24 hours would, in a very large proportion of cases, be far too severe a test and one which very few horses could accomplish

satisfactorily. I would suggest the following scale as minimum for time:—

100 miles ride not less than 26 hours.	
150 " " "	45 "
200 " " "	68 "
250 " " "	96 "
300 " " "	130 hours."

Hardly any two of the marches recorded were undertaken under quite the same conditions so that no convincing proof of the powers of endurance of any particular one of the various breeds of horse in the cavalry in India was arrived at, although General Luck, judging from the march of 105 miles in 38 hours from Sibi to Jacobabad by different routes without baggage, made by the Sindh Cavalry Brigade (5th and 7th Bombay Cavalry) was inclined to favour the northern (or Cabulee) horse, which, as a rule, is considered too great a slug for service purposes.

On service large bodies of cavalry would seldom be required to cover more than 20 to 30 miles in a day. Officers' and other patrols would on the contrary be frequently called upon to cover 60 miles or more. Therefore the accompanying table which shows in detail the rides of two officers' patrols, *viz.*, British officer, 13 rank and file of the 3rd Bengal Cavalry for 60 miles, and, British Officer and five sowars of the 4th Bombay Cavalry (Poona Horse) for 186 miles respectively, combined with the following reports submitted by Lieutenant-Colonel Hogg, Commandant, Poona Horse, will serve as a good general guide as to the powers of endurance of men and horses, and for the purpose of calculating the time required for long marches of small and large bodies of cavalry.

No. $\frac{B}{65}$ of 1887, Poona, 14th March 1887.

From—The COMMANDANT, Poona Horse.

To—The ASST. ADJUTANT-GENERAL, P.D.A., Poona.

SIR,—I have the honour to submit a report from Captain Anderson, giving details of a long distance march lately carried out under his command, and also copies of the orders issued by me for his guidance. I have made marginal notes in the report for the sake of easy reference.

The conditions of the march were as follows :—

- (1) A hard macadamized road to travel on.
- (2) Selected horses over two years and not exceeding eight years' service. The men volunteers mostly of slight physique.
- (3) No training of any kind whatever except such condition as is produced by hard field-days.
- (4) Small party of five men.
- (5) Baggage-ponies accompanied the party carrying 150lb. besides the pack-saddle; that is, a light syce and the horse blanket, men's great-coats, bedding, cooking-pots, and other light things.
- (6) Marching order average 6st. 2lb., average of men 9—1: total 15st. 1lb. Out of this the great-coats and horse blankets were carried on the ponies, reducing the amount actually carried by the horse to 14 stones.
- (7) The weather was very hot, especially after leaving Ahmednagar.

My opinion as to the method of carrying out these marches is much the same as it was previously, with the exception, that I think it perhaps better in hot weather to march at 7 P.M. instead of 12, provided you are on road and can't miss your way. Floundering about in dark, trying to find out the way is, I think, a fatal mistake. The orders I issued will show my ideas on the subject, and I will only briefly summarise them by stating :—

(1) In long marches you must trot or you cannot get over the distance. Trotting and walking alternate distances give an actual marching pace of $5\frac{1}{3}$ miles an hour, which, with a two hours' halt would, on a 50-mile march, give $4\frac{1}{3}$ miles an hour, including halts.

(2) Saddles and horses' feet must, of course, be attended to before starting; but it is decidedly inadvisable to stuff saddles fresh just as you are starting, or to put on new shoes if it can be avoided, though clenches should, of course, be hammered down.

(3) Always send a farrier if you can spare him. Farrier's services cannot be depended upon in native villages.

(4) A spare horse should always accompany a party.

(5) In hot weather, march at night. In cold weather, arrange to arrive by mid-day.

(6) Feed and water the horses every three hours. Two halts of three-fourths of an hour, and one of half-an-hour will permit of this.

(7) The more hand-rubbing the horses get the better. Dry linen bandages sufficiently drawn to cause pressure without being tight after the grooming is over.

(8) Long marches of 50 to 70 or 80 miles a day executed during time of peace with small parties and lots of food, are a most unsafe guide to follow during the time of war.

(9) Baggage ponies could not accompany cavalry on long marches, unless the syce was permitted to ride, with light kit and a light syce—say, a syce weighing 8st. and 50lb. of kit, ponies could march 50 miles a day for four days, provided they were in good order to start with. If there was only one syce to two ponies, more kit might be carried, as the syce would ride the ponies alternately.

(10) Long marches continued for any time would soon ruin any cavalry regiment, and the faster the pace the greater would be the damage done.

(11) Dust is fatal to long marching, as the horses don't get pure air to breathe and are choked.

REPORT ON MARCH FROM POONA TO MALEGAON.

23rd February to 26th February 1887.

Railway and Telegraphic communication were supposed to have been cut off between Poona and Malegaon, and instructions were received from General

Officer, Poona, to proceed with an emergent letter to the Officer Commanding at Malegaon, and to reach that station within four days.

An European officer and five men of the Poona

*Note by Commandant,
Poona Horse.*

Horses marched $3\frac{1}{2}$ miles an hour, including stoppages. Too slow for a long march.

Note by Commandant.

Ponies marched $3\frac{3}{8}$ miles an hour, including stoppages.

Horse were detailed for the purpose and left the Cavalry Lines, Poona, at 1 A.M., Wednesday, 23rd instant, intending to bivouac that night at Narayengaon, distance 49 miles from the Cavalry Lines. The party reached Narayengaon at 2-30 P.M., halting and feeding three-fourths of an hour at Shikarpore, half-an-hour at Ranjungaon and three-fourths of an hour at Sirur, thus averaging 4 miles an hour. The baggage tattoos arrived at 4-15 P.M. or before the men, after watering and feeding their horses, had been dismissed from evening stables. One horse, Naik Nazir Ali Khan's, had the hair rubbed off under the girth, which was during the remainder of the march, as a precaution, encased in a bag covered with oil, and on arrival at Malegaon no sign of girth gall was visible. This was the only case approximate to a girth gall during the whole march to Malegaon.

One horse, Duffadar Meadin Khan's, during the feed on the march, refused his gram and also his second feed in camp. On other occasions during the onward marches this horse left one or portion of one of his feeds, but had no sign of fever, and arrived at Malegaon in excellent condition.

2nd. Day.—Thursday, February 24th, left Narayen-
gaon, 12 midnight, and reached

Note by Commandant.

3½ miles an hour, in-
cluding stoppages. Too
slow and necessitated
too much exposure to
the sun.

Mahawaree 3-45 P.M. (50½ miles).
Halts were made at Ahmednagar
1¾ hours, at Sangwa ¾ hour, thus
averaging as on first day, march-
ing 4 miles an hour.

Tattoos arrived at 4-30 P.M. One of them was off
his feed, and this was the only
case amongst them during the
march.

Note by Commandant.

Ponies marched 3
miles an hour, including
halts.

3rd Day.—Friday, February 25th, left Rehewaree

Note by Commandant.

3½ miles an hour, in-
cluding stoppages. Too
slow.

11-30 P.M. and reached Munmad
7-30 P.M. (60¾ miles). Halts:
½ hour at Rahatna, ¾ hour at
Kopergaon, and ½ hour at Sand-

gaon. The average of this march was only 3½ miles
an hour, but there were additional minor halts of 10
minutes or so which would bring up the average.

The heat was very great during this march especially.

Note by Commandant.

I doubt whether the
horses could have
reached Malegaon within
72 hours. They had on
the third day of their
long marches marched
continuously for 20 hours,
including a whole day in
the sun, and by the hour
they reached Munmad
they must have been in
want of rest.

The men were willing to push on
to Malegaon after an hour's halt,
and it could have been reached in
the 72 hours from Poona, as the
horses were all fit, but it was
deemed unnecessary.

Note by Commandant.

Tattoos travelled just under 3 miles an hour.

The tattoos arrived at 9-30 P.M.

4th Day.—Saturday, February 26th, left Munmad

Note by Commandant.

Rate of march of whole march $2\frac{1}{3}$ miles an hour for horses, including stoppages.

For ponies $2\frac{1}{4}$ miles, including stoppages.

3-30 A.M., reached Malegaon 8 A.M., distance 24 miles (through a mistake, the party, which was to have been aroused at 1-30 A.M., was not aroused until nearly 3 A.M.). The horses and men at the end of this march (a great deal of which was accomplished at a trot)

were inspected by the Officer Commanding Malegaon. All the horses ate their feed and like the men could have gone on another 40 miles this day, if required. There were no girth galls or sore-backs, and only two slight swellings under the saddle. The tattoos arrived at 11-45 A.M., all fit. There was a slight delay on the road owing to one of them (Sowar Durshun Singh's) eating his feed slowly.

As previously stated, had the march from Munmad been continued on to Malegaon after an hour's halt, it would have been accomplished within 72 hours, instead of 79 hours, but the object being gained, viz., opening of communication within four days, it was not deemed necessary.

Note by Commandant.

I agree with Captain Anderson, the weather was too hot for long marching.

The month of January and early in February would be more suitable than the time just occupied for the march.

POONA:
27th February 1887.

(Sd.) J. A. ANDERSON, CAPT.,
Poona Horse.

SECTION VI.

FIELD MANŒUVRES.

1. *General idea.*—A general idea will be issued beforehand for the information of all concerned. It is to be re-issued in brigade, regimental, squadron, battery, and company orders.

2. *Special ideas.*—In framing special ideas, care is to be taken that the scheme is in each case suitable to the force to be employed and the ground available. Special ideas will be communicated confidentially to the commanders of forces shortly before the exercise, but in sufficient time for them to be communicated to all units, whose officers will be responsible that they are read and explained to each squadron, battery, and company, at the place of assembly, or elsewhere, on the day of execution.

When the ground available for manœuvre is limited or forbidden ground intervenes within the area selected, if the opposing forces are placed sufficiently far apart before the commencement of operations, this separation will allow of initiative on the part of the commanders and also of preparatory artillery fire.

3. *Orders framed on special ideas.*—In detailing a force for an operation its strength and composition should be proportionate to the ground available. The orders issued by commanders of forces should be short, clear, and free from ambiguity. These orders and the

general instructions based on them are to be communicated by officers commanding units to the whole of their officers, who will follow them on their maps, and explain them afterwards to the other ranks.

4. *Reports.*—All reports, whatever their nature, are, if practicable, to be in writing, with the signature of sender, the place, hour, and date.

It is usually desirable that an orderly should have a message, he is going to take, fully explained to him before he starts.

Staff and orderly officers are to take down in writing verbal orders given them to carry, unless these be of minor importance, when they may be conveyed verbally. In such case the officer is to repeat the order before riding away.

Written reports and orders, as well as all signal or telegraph messages, are to be carefully preserved, and handed to the senior umpire at the conclusion of the manœuvre.

5. *Units as basis of calculation.*—The strength of opposing forces is to be estimated by squadrons, battalions or batteries, or in the case of smaller bodies (when detached as such under their proper commanders), by troops, sections or guns, half-battalions, companies, half-companies, or sections, and not by their actual effectives.

6. *Bugle Calls.*—No bugles or trumpets are to be sounded, except by order of the umpire-in-chief.

On the undermentioned *calls* sounding, the troops will act as follows:—

(a) *Halt*.—Cease fire; infantry lie down, or if the weather be wet, stand at ease with ordered arms; mounted troops dismount.

(b) *Advance*.—The engagement is resumed.

(c) *Cease fire*.—Conclusion of operations. Units form up ready to march home.

(d) *Cease fire*, followed by *Retire*.—The troops will march home after arms have been examined; and if cordite has been used, after the barrels have been wiped out.

(e) *Officers' Call*.—Officers commanding regiments, battalions, batteries, and squadrons, and the umpire staff repair to the umpire-in-chief.

RULES FOR TROOPS.

1. *Dress*.—The opposing forces will either be in different *orders* of dress or wear some distinguishing mark.

2. *Ball ammunition*.—Before troops leave barracks to manœuvre, the following certificate is to be furnished by commanding officers of battalions:—"I certify that the magazines and the pouches of the men of my battalion were examined on parade, and that an officer felt at the bottom of every pouch and found no ball ammunition in any of them."

3. *Bayonets not fixed, swords not drawn*.—Bayonets are never to be fixed by infantry, nor swords drawn by mounted troops when there are opposing bodies.

4. *Action in villages, enclosures, etc.*—Villages and enclosures with troops formed in front are to be considered as occupied, if the troops have been there sufficiently long to admit of such occupation being carried out. Troops are not to enter private grounds, coverts, or gardens. Banks or fences are not to be injured nor game pursued.

Railways are only to be crossed by the regular bridges and crossings.

Firing near buildings or ricks should be avoided as much as possible, and every precaution taken to guard against fire. If a fire breaks out the nearest officer will temporarily suspend the movements of his command and extinguish it.

5. *Action on roads.*—Cavalry operating on a public road will not move faster than the *trot*, and must be *halted* or turned about at 50 yards distance from any of the opposing force it meets.

As a rule, artillery on a public road will not fire. When space permits, a single gun may be unlimbered and placed in position, but without firing. Only when unoccupied by the public, with no horses or carriages near, may single shot be fired to mark the position. Under the same restrictions at a bridge or defile a few rifle or carbine shots may be fired.

6. *Forced marching.*—All hurry and forced rate of marching (unless under special circumstances), or a more rapid advance under fire than would be possible in actual warfare, is to be avoided.

7. *Patrols, Scouts, etc.*—When patrols or scouts of opposing forces meet, those that are supported by superior formed-bodies within reasonable distance will be allowed to proceed : those belonging to the opposing force will be sent back to their nearest support.

Individual officers or scouts are not to approach, mounted, within 600 yards of a firing line, unless under cover. If they approach nearer, they will be ruled out of action by umpires ; they are not to be captured.

Signalling parties are liable to be ruled out of action if beyond the limits of protection by their own troops.

8. *Distance to be preserved between opposing bodies of troops.*—When cavalry is attacking cavalry, artillery, or infantry, it will not actually charge, but will decrease the pace when 200 yards distant, and halt at 100 yards. Cavalry is not to ride through batteries of artillery. Infantry is not to approach an opposing body of any arm nearer than 100 yards in the open, and 50 yards in enclosed country. Firing at less than 100 yards range, by any arm, is not permitted.

When the limit of 100 yards is attained, the opposing bodies are to halt, cease firing, and wait until it is decided which is to retire.

9. *Skeleton Enemy.*—When a skeleton enemy is employed, it should occupy the correct front and depth of the force it represents, and move at such speed only as would be attainable by the full force represented when moving at the regulation paces.

10. *Orders by umpire staff.*—Orders given by the umpire staff are to be regarded as the orders of the umpire-in-chief, and are to be carried out without discussion. A decision once given can only be altered by the senior umpire.

11. *Cavalry.*—That body of cavalry against which an umpire has decided, will retire 300 yards. The victor may re-form, or follow with his whole or with portions of his force; but he may not approach nearer than 100 yards. If the defeated force is not reinforced, it must, without re-forming, continue to retire, so long as the victor is in sufficient force. The umpire will see that the pursuit is not too extended, and decide, by the manner and the force of the pursuit, the length of time the defeated body is to remain out of action.

12. *Losses.*—The losses of cavalry, when repulsed by artillery or infantry, should not be estimated by less than troops.

13. Cavalry will only fire at any one body of troops advancing a sufficient number of rounds to denote its position. Credit for effect of fire will be given as if a sustained fire were kept up.

14. *Artillery: Indication of target.*—When artillery opens fire at long ranges, after the range has been determined, only occasional shots will be fired to mark the position. A screen will be exhibited to mark the target fired at, coloured as follows:—

If at cavalry—black and white diagonally.

If at guns—white.

If at infantry—black and white horizontally.

The screen is to be placed well forward where it can be easily seen, and have, if possible, a good background.

To further denote the target fired at, guns will be fired as follows:—

If at cavalry—by single guns.

If at artillery—by two guns in rapid succession.

If at infantry—by three guns in rapid succession.

Whenever guns are fired, the description of fire must correspond with the target aimed at as above.

When guns open fire the commanding officer will enter in his note-book the object of his fire, the range, and how estimated, the projectile, and the exact time of commencing and discontinuing the fire.

When batteries are put out of action they will limber up to the front at close interval, as near as possible on the line on which they were in action, men dismounted.

INFANTRY.

15. *Fire discipline and supply of ammunition.*—Strict fire discipline and the economical use of ammunition are to be enforced. Only five rounds should be carried in the pouches at the commencement of the operations. The remainder is to be carried in the ammunition carts or on mules, and issued as required on requisition. If, on open ground, the carts or pack-animals are brought up nearer than 500 yards to an enemy firing, the nearest umpire will decide as to the result. Troops are not to be supposed to be in possession of any ammunition not actually carried.

Infantry will only fire at any one body of troops advancing a sufficient number of rounds to denote its position. Credit for effect of fire will be given as if a sustained fire were kept up.

16. *When beaten.*—Beaten infantry cannot reform for attack until it reaches supporting troops or shelter. Victorious infantry may pursue at 200 yards distance.

RULES FOR THE UMPIRE STAFF.

1. *Organization.*—The umpire staff consists of the umpire-in-chief, a senior umpire, umpires, and assistant umpires. They are to study the general principles for the working of the arms of the service other than their own, and are to be thoroughly conversant with Part V, Infantry Drill. The duty of umpires is to see that these rules are adhered to. They are not concerned with criticising the operations.

2. *Selection and distribution of Umpires.*—At every manœuvre the director of the whole will act as umpire-in-chief. Umpires may only consider the actual situation of the moment, and not the intentional idea of the manœuvre. The umpire-in-chief is alone empowered to interfere with the progress of events. It may be desirable at times for the umpire-in-chief to suspend the operations temporarily, and to review the situation; but he should seldom revise the senior umpire's decision on the spot. The senior umpire is responsible for the distribution of the other umpires. Umpires and their assistants are, when practicable, to meet the senior umpire before the commencement of operations, when they will be informed of the positions occupied, as well

as the orders given on both sides. A senior umpire should, if possible, be one grade higher in rank than the commanders of the opposing forces; he should be provided with one or more orderly officers and mounted orderlies. The number of umpires should be sufficient to ensure a decision being given before a situation becomes unnatural.

Umpires before being appointed should have previously acted as assistant umpires; they should be changed as seldom as possible. Umpires will be allotted at first to bodies of troops, then, as these approach each other, to areas of ground, where they will give decisions indifferently to either side.

There will be one senior umpire, and only one set of umpires.

When more than one battalion is employed, umpires should not be under the rank of field officer; assistant umpires may be of lower rank.

Umpires when with troops should be careful to keep as much out of sight of the opposing force as the nature of the ground will allow.

3. *Assistant Umpires.*—Assistant umpires are appointed to inform umpires of the strength and position of the troops, the number of guns in position, and the objects they are firing at. The duties of these officers are to accompany officers commanding units, receive from them particulars of all orders issued, and note the progress of events and the situation of the troops. On a collision being imminent they report the situation to the senior umpire. They may give decisions in cases

that are *quite clear*. When not clear they may direct the cessation of proceedings until the decision of an umpire can be obtained.

Special umpires, if possible, are to be detailed for the supervision of artillery combats. As their decisions may influence the engagement of the other arms, they must make these known, not only to the artillery and to the senior umpires, but also as far as possible to the other umpires employed within the artillery sphere of action, and to the troops.

4. *Dress*.—In the absence of special orders umpires will be in drill order. All wear a white band on the *right* arm above the elbow.

All other neutrals in uniform will wear a white band on *left* arm.

5. *Special ideas*.—Officers in command of forces will inform the senior umpire what orders they have given, and what they propose to do.

6. *Orders for the attack*.—The umpire-in-chief is to listen to the explanatory directions of the officer commanding the attack for the distribution of the force, and for the several phases of the attack, and if he is not satisfied that the orders provide for this distribution, and as far as can be foreseen at the time for the subsequent successive phases of the attack, he will require them to be rectified before any movement is made to the front.

If the scheme of attack does not permit of this division into phases, umpires will record the fact on the spot for mention at the conference.

Umpires may, acting within these regulations, rule troops or guns out of action. To encourage independent action on the part of subordinate commanders, and avoid situations impossible in war, they should, when opportunities offer, inform commanders of the effect of their fire upon the enemy, as well as of that of the enemy upon them.

It is undesirable to lose time in estimating small losses. Umpires when declaring troops incapable of advancing, or when enforcing a retirement, should briefly state to the commander the reason for such order, reserving full explanations for the conference. Umpires placing troops out of action will give the officer in command a memorandum, showing the time that his men are to remain out of action. Troops should never be placed out of action for more than half-an-hour.

Troops so placed out of action must retire at once out of the fighting force, and, at the expiration of their allotted time, join the reserve.

7. *Decisions by Umpires.*—Umpires will decide questions for all arms, without reference to their effect on the general course of the manœuvres. When the senior umpire is at hand, other umpires should obtain his approval before giving important decisions. They will report any hesitation to comply with their orders.

Umpires should at once inform the senior umpire of decisions which materially affect the day's operations.

In the same way the commanders of troops are to report the decisions of umpires to their senior officers, and communicate them to the troops on either flank.

Decisions given concerning artillery must specify whether the guns, or any of them, are unable to move, and for what time.

Umpires are not empowered to order artillery in action to retire from their positions.

8. *Action on a collision becoming imminent.*—When there is a prospect of collision, umpires should draw between the forces. After discussing the tactical situation, based on the strength and situation of the two sides, they must decide which side, if either, is to retire. The decision need not necessarily be given by an umpire; if one is not present, the commanders on either side should confer together and agree which is to go back.

9. *Time of prominent events to be noted by Umpires.*—Before commencement of operations, the watches of umpires should be compared, or set in agreement. Umpires are to note down the exact time when each prominent event in the day's proceedings take place.

10. *Estimates of loss.*—Losses are to be estimated by squadrons or troops, sections or guns, half-battalions, companies, half-companies, or sections, and not by their actual effectives. Where a case admits of any doubt it will generally be desirable for the umpire to decide in favour of the force acting on the offensive.

11. *Umpires dismounting.*—To enable umpires and assistant umpires to judge of the fire discipline of infantry and artillery they should dismount and note by personal inspection the ranges, the adjustment of the sights, the aim, the steadiness of fire, and the protection

given by the formation of the ground. This is especially essential when an attack by cavalry on infantry or artillery appears imminent. They may call on the officer commanding the troops to furnish men to lead their horses.

12. *Summary of events at conclusion of day.*—At the conclusion of each day's proceedings, commanders and umpires will give the umpire-in-chief a brief verbal account of the day's events, as seen by or reported to them.

In restricted areas and in the neighbourhood of garrisons, it may sometimes be undesirable to lay down authoritatively the exact solution of any tactical problem, as the decision may prevent initiative in future. At autumn manœuvres if the umpire-in-chief does not approve of the measures taken, he must always give a distinct opinion as to how the operations should have been carried out.

13. *Written reports.*—If the operations have been extensive, the senior umpire will send into the umpire-in-chief a written report within three hours after termination of the day's manœuvres.

This report will be based on his own observations and on his umpire's notes, and should be as short and concise as possible.

In the case of less important operations, a written report will not be required, but immediately before the conference the senior umpire will collect the notes made during the day, and hand them, together with his own, to the umpire-in-chief. The umpire-in-chief will collate

the results and will publish, as soon afterwards as practicable, a summary of events and his criticism upon them, for the information of all concerned.

GENERAL PRINCIPLES TO GUIDE THE UMPIRE STAFF.

1. *Decision.*—The rules laid down for umpires are to be regarded only in the light of general principles for assisting them in giving decisions. Even at manoeuvres circumstances will arise that cannot be met by definite rules.

In all decisions special importance must be attached to moral influence so far as they obtain in peace as shown by the order and steadiness of the men and the efficient exercise of command.

The power of putting troops out of action should not be exercised, except where it is necessary to show the combatants the effect of their actions.

2. *Principles guiding decisions.*—In forming their decisions umpires must be guided by the following considerations: (a) the relative force engaged on each side and in immediate support or reserve; (b) in the attack—the strength of a position, the nature of the ground to be passed over, the plan of attack and its preparation by artillery fire; (c) on the defensive—the dispositions of the troops, and arrangements for counter-attack; (d) the handling and fire discipline of the troops on either side, the number of rounds that could be fired, the accuracy of the sighting, and the manner in which the fire was delivered; (e) in an attack by cavalry—the degree of surprise, the appropriateness of the moment, the

steadiness of its advance, its formation, the advantage of ground, and the nature and quality of the fire to which it is exposed—and in the attack on infantry, by the length of time it was under fire, the number of rifles opposed to it, its speed, formation, and cohesion up to the moment of collision (imaginary); (f) as regards guns, the manner in which batteries are brought into action, the accuracy in finding the range, fire discipline while engaged, the arrangements for supply of ammunition and protection of teams, the nature of the projectiles, and the care in laying.

Umpires must be careful to observe whether troops under artillery fire, as indicated by the screen referred to in page 142 alter their formations or seek cover.

3. *When works, etc., can be carried by a rush.*—Neither works (imaginary), farmsteads, villages, defensible and prepared woods, or copses, can be considered liable to be carried by a rush, unless the attacking force has an overwhelming superiority of force. Attacks of this kind have to be specially prepared, and the decision of the result will rest with the senior umpire.

PRINCIPLES APPLICABLE TO CAVALRY.

1. *Attacking Cavalry.*—The situation of the enemy, pace favoured by ground, and the manner of executing the attack, are specially important considerations. Should cavalry succeed in attacking in flank, or while the enemy is deploying, it may be adjudged victorious, although inferior in strength. Weight must be given to fire of any sort against either side just before or during the attack.

2. *Attacking Artillery.*—If unprotected by other arms, artillery on the move is at the mercy of a cavalry attack.

A frontal attack on guns will entail heavy loss, but should not be considered impracticable.

Decisive results can alone be obtained by a brigade being held together and worked as a whole. The isolated action of separate regiments can only result in partial successes; it can seldom be desirable to split up a brigade for the purpose of attacking guns while the main body of the opposing cavalry is intact.

In coming to a final decision, it should be considered whether in war the victorious cavalry would be able to carry off or render useless the guns or limbers; or to confirm its success in other ways.

3. *Under Artillery fire.*—Cavalry halted or moving at a walk, when under artillery fire at and under 1,000 yards, will be adjudged to suffer heavy loss.

4. *Cavalry: Formation within 800 yards of Infantry.*—If formed-bodies of cavalry approach in sight, and within 800 yards of infantry, which is not otherwise engaged, they will be adjudged to suffer severe loss proportionate to the number of rifles directed on them, provided the range be accurately given.

5. *Attacking Shaken Infantry.*—It is of the greatest importance to take infantry in flank. Against shaken or weak infantry even small bodies of cavalry may be successful. When the ground is undulating and favourable, cavalry may often produce a greater effect and suffer less loss by surprising the flanks of the supports or reserves, than it can by attacking the firing line.

6. *Unshaken*.—Against unshaken infantry a deep formation and an attack steadily conducted and carried through is required. Should the ground not admit of a screened approach or of surprise, then the cavalry must pass quickly over the fire-swept ground. Should the infantry be tempted to alter its formation or display bad fire discipline, it gives the cavalry a great advantage. Such attacks will be productive, when successful, of heavy loss to the infantry.

7. *Dismounted Cavalry*.—The fire effect of cavalry fighting on foot must be considered in the same way as that of infantry.

PRINCIPLES APPLICABLE TO ARTILLERY.

1. *Points influencing its action*.—As regards artillery action, the following points should be considered:—

(a) How far its advance is sheltered, and its opening fire takes the enemy by surprise. (b) The choice of position as regards effective fire action and cover, the facility for observing the effect of the fire and rendering it difficult for the enemy to observe the effect of his fire and to find the range. (c) The distance from the target, its extent, visibility, and mobility; the nature of fire employed, its duration and rate, and the fire discipline generally. (d) The number of batteries engaged against the same object. (e) The losses caused by hostile fire. (f) The manner in which the limbers and wagons are disposed. (g) Flanking artillery fire must have great importance attached to its effect. (h) It should be borne in mind that guns can be fought up to the moment of capture, provided there are three working numbers per gun.

2. *Casualties.*—Artillery advancing or retiring under fire, may be adjudged to drop guns, limbers, or horses, from casualties, or to have guns delayed (up to ten minutes) according to the intensity of the fire.

Umpires should frequently designate part of a gun or its equipment as disabled. The horses, or parts of the gun named, will be removed; and, if possible, replaced on the spot.

An umpire may order artillery which is engaged to cease fire, but an order to retire from its position can only be given to the artillery by the officer commanding the force or the detached portion of it.

3. *Firing on Cavalry and Infantry.*—Cavalry halted, or moving at a walk, or enfiladed infantry in any formation affording a fair mark, may be adjudged to suffer loss from guns at ascertained ranges under 2,000 yards.

A battery having concentrated its fire on a bridge over an unfordable stream or on a defile at verified ranges under 2,000 yards, may be considered as successfully opposing the passage. If itself under effective fire, the case must be decided according to the opposing conditions.

4. *Against Artillery.*—Up to a range of 2,600 yards, artillery which has found the range can entail loss to a superior number of hostile guns while unlimbering. In an artillery combat with more than one battery on either side, the contest cannot be supposed to last for more than 20 minutes, the range not being more than 1,500 yards.

5. *Effect on closed bodies.*—Closed bodies, equal in strength to a squadron, can only halt in the open at ranges between 1,500 and 2,200 yards under well-sustained artillery fire, when such fire is met by opposing artillery fire. The same rule applies to infantry offering a fair target at ranges between 1,000 and 1,500 yards.

At ranges between 1,000 and 1,500 yards, infantry can only move to the front or rear in line, unless the ground admits of temporary cover; cavalry moving at a walk under such fire in open ground will be adjudged to suffer loss.

6. *Against Infantry in extended order.*—At 1,100 yards artillery can hold out against the fire of extended troops. If strong extended lines approach to 650 yards of guns, insufficiently protected by their infantry, the artillery must retire or be liable to be adjudged to suffer heavy losses.

7. *Under close Infantry fire.*—Guns may not be limbered up under the close fire of infantry which is not itself otherwise engaged. If gun teams have been exposed to it the guns may not be moved for twenty minutes.

PRINCIPLES APPLICABLE TO WORKS, ETC.

1. *Shelter-trenches.*—A shelter-trench can be made available for single rank in half-an-hour. The umpires must satisfy themselves that the necessary tools are on the spot. If screens are not available, the position of trenches is to be marked by picks and spades stuck in the ground.

2. *Destruction and repair of bridges.*—Lightly built bridges can be considered as destroyed in fifteen minutes, provided sappers' tools, and materials are actually on the spot. Cavalry pioneers with their equipment may be assumed to take twenty-five minutes.

Bridges can be repaired by sappers in half-an-hour, provided the materials are available.

When troops retire from an imaginary barricade or other obstacle, a non-combatant should be left on the spot to mark the site until it is ruled that the obstacle is destroyed.

PRINCIPLES APPLICABLE TO INFANTRY.

1. *Effect of Infantry fire.*—The effect of infantry fire is affected by various considerations, such as the range and its correct estimation, the nature of the target, the duration of the fire, the fire discipline, and any surprise or other disturbing element. Having in view the necessity for saving ammunition it will not generally be possible in peace manœuvres to estimate the *intensity* of fire.

2. *Closed bodies coming up under Infantry fire at 800 yards.*—When opposed to a well-conducted, severe rifle fire, closed bodies of troops without cover can only get up to 800 yards, or move to a flank when the fire of their advanced troops is about equal to that of the enemy. A halt made for any length of time within these ranges without cover, will necessitate an umpire's decision.

3. *Under 700 yards.*—Under 700 yards, even when covered by a strong firing line, closed bodies of infantry can only move directly to the front or rear.

When the fighting line is closely engaged, that is at a distance of 500 yards (more or less according to the nature of the ground), no umpire is to permit a superior commander in rear to send forward an order unless it is despatched to the firing line with adequate reinforcements.

4. *Decision under 350 yards.*—At distances under 350 yards the decision on the fire fight in the open must be speedily given.

5. *In a defensive position, frontal attack.*—(a) Infantry, if judiciously posted behind a shelter-trench or earthwork, can only be dislodged by a front attack, well commanded, and showing effective fire discipline of—3 to 1, with effective artillery fire for at least 15 minutes; 4 to 1, without artillery fire. The attackers lose one-third if unsuccessful, one-fourth if successful. Defenders one-fourth if dislodged.

(b) If judiciously posted in a strong position, but not entrenched, it can only be dislodged by a front attack of—2 to 1, with effective artillery fire for at least 15 minutes; 3 to 1, without artillery fire. The attackers lose one-fourth if unsuccessful, one-sixth if successful. Defenders one-fourth if dislodged.

When a position has been successfully assaulted, the umpires must decide how long a time is to elapse before pursuit is permitted. This time will vary in proportion with the nature of the assault, and the losses sustained by the victors.

6. *Flank attack.*—A flank attack may turn either a good position or earthworks, and troops outnumbered and outflanked must usually retire.

7. *Meeting in the open.*—When infantry meets infantry at 100 yards, both sides advancing, and neither side takes up a defensive position, the weaker must retire.

8. *Bayonet attack.*—When judging the result of a bayonet attack (bayonets not to be fixed), the following points must be considered:—The previous effect produced by artillery and infantry fire; the number of fresh troops that both sides have thrown into the fight; the way in which the fighting has been carried out; if a flank has been turned; and the nature of the ground.

9. *Holding a defile against mounted troops.*—Twelve men on foot, in position, may hold a narrow defile (say, 12 feet wide) against mounted troops, provided they have a good field of fire. If the latter dismount, rules for infantry attacks will apply.

NOTES ON FIELD FIRING.*

1. Umpires will furnish written reports dealing in detail with each point mentioned in the Musketry Regulations, particular attention being given to the following subjects:—

2. *Explanation of plan of attack.*—If the enemy's position was clearly pointed out, and the plan and direction of the attack explained to all officers and non-commissioned officers.

* This subject, though not forming part of ordinary Field Manœuvres, is included here for convenience of reference.

3. *Range*.—The extent to which range-finders were used. Were the distances given by the range-finding party adopted by the commanders? How far the sights were adjusted and used by the men? The accuracy of the ranges given, as deduced from the results of the fire both of artillery and infantry.

4. *The advance*.—Formations adopted at the various ranges. How far officers and men were exposed to fire? At what stage of the attack did the mounted officers dismount? In the case of cavalry were the horses of the dismounted men led as far as possible under cover.

5. *Fire discipline*.—Description of fire used. Manner of giving words of command by company and sectional commanders. How far the commanders named the particular part of the position on which each volley was to be directed? On what parts of the position was the fire of artillery and infantry respectively directed. Were the positions in which the men fired adapted to the various ranges and to the ground? Did commanders use field-glasses to observe and direct the fire?

6. *Machine-guns*.—Were they well handled by the detachments? On what objects was their fire directed?

88. The question of umpires at camps-of-exercise is the most difficult one connected with our annual manœuvres. First as to number. It will be admitted that each regiment, battery and battalion should have an umpire attached to it. Each brigade

Umpires at Camps-of-Exercise.

and larger unit also requires an umpire, and there should be an umpire-in-chief. Umpires for squadrons and companies would be very desirable, but there is no use in desiring the absolutely unattainable. In view of the requisite qualifications of an umpire, no army in the world could furnish a sufficient number of trained officers for this. If we take the case of two mixed brigades operating against each other, the total force being 2 regiments of cavalry, 2 batteries of artillery and 8 battalions of infantry, 12 umpires would be required besides 2 brigade umpires and one umpire-in-chief. An umpire to be of the least real use must be intimately acquainted with the drill, tactics and powers of each of the three arms. He must be a man who has read much and formed accurate ideas as to the time necessary for firearms to get the range and inflict appreciable loss. Losses inflicted by fire are always enormously exaggerated by umpires. They must bear in mind the probable state of the troops they are observing considering the fire they have been exposed to; and especially they must consider the ground. In the case of guns the range is the thing to be considered, and in five cases out of six when firing at a moving object the range will be wrong and shrapnel ineffective. The same is the case with rifles and machine-guns, the difficulty being increased by the impossibility of seeing where the bullets strike. Movements undertaken under very unfavourable conditions, or under circumstances not warranted by experience in war, should not be allowed to succeed. Manœuvres are not a game, but a school of war, in which umpires are the schoolmasters. From the above it would follow that no man should be appointed an umpire till he has shown that he has the

qualifications enumerated. The examination for majority or staff is not nearly sufficient. At large stations Boards might be occasionally assembled to examine officers for the post of umpire, and the successful candidates should always be selected for duty at manœuvres. A man may be an excellent regimental officer and yet be useless and injurious as an umpire. This said as to the qualifications of umpires, now a few suggestions as to the conduct of manœuvres, with a view to making them more instructive than at present.

Manœuvres begin by small parties of cavalry meeting, and on these occasions umpires can rarely be present. In the case of bodies under the strength of one troop, the following rules should be observed:—Any body which is charged when dismounted or halted is beaten, no matter how superior, provided it is charged by at least six men. All defeated bodies retire, till they fall in with another body of their own side. When two small parties meet in motion, they toss up who retires, when the difference does not exceed 25 per cent. Otherwise the smaller retires; at any rate it must not receive an attack. Carbine fire is not effective over 500 yards or on men in motion, at a trot, at over 200 yards. Within these distances at least 20 rounds must be expended for a casualty. Infantry fire is not effective on men galloping at over 500 yards or on men in motion over 800 yards. Within these distances 50 rounds must be expended for a casualty, on men in motion. Cavalry must never charge and the pace of the gallop must never be increased. Cavalry will always gallop to within one horse's length of each other. If the gallop is not increased, there is no difficulty in this. In the

case of squadrons and larger bodies, each body goes on till it meets another. Having met they are supposed to be in *mêlée*, for from two to four minutes according to their size, during which they remain halted opposite each other. When one body takes another in flank, it halts one horse's length from the flank, and the outflanked body also halts. When one side or both have used up all their men the umpire present gives his decision, judging by the cohesion, before the shock, and especially the last formed-body, bearing in mind the two minutes at least for the *mêlée*. Cohesion will, of course, be presumed to be affected by either side having been under fire during its attack. If no umpire is present the last body out of action decides the combat. The beaten side must retire on support, and cannot rally before reaching it. The victors can rally and follow at once—till driven back by superior force—if they desire to do so. The umpire will remember that the attack of 10 men in flank and rear has more effect than that of 100 men in front.

In the case of artillery, the range is the chief thing to be considered. The effective range is 2,500 yards. Formed-bodies cannot press home a frontal attack on guns over open ground, but guns cannot stop skirmishers. Skirmishers within 800 yards prevent a battery moving if 100 rifles are directed on it. A battery charged in flank is taken, and if it remains so for five minutes is out of action for an hour. Guns cannot remain more than 15 minutes in action against a superiority in guns of 3 to 2, within 2,500 yards.

In the case of infantry no front attack can succeed, unless delivered by a fresh body of troops; except

where the defenders are enfiladed from another direction. No superiority in numbers will warrant a front attack being pushed home against 100 rifles. Infantry within 600 yards of, and under fire from, hostile infantry may always be successfully charged in flank or rear by cavalry. If met by frontal fire from infantry who are not engaged with infantry, the cavalry attack will fail. It is not too much to say that there will be no verisimilitude in our manœuvres, and no real instruction, till our infantry carry their full complement of blank ammunition, the same number of rounds that they would in the field; with the mules and ammunition carts following, and a regular system of supply of ammunition. We should then have proper fire discipline, and when a body has exhausted its ammunition it must retire; or be defeated if attacked, or charged. Successes in war are usually gained by one side or the other having exhausted its ammunition, at some point or other—usually a decisive one. This is at once evident to the troops engaged with them and affords the opportunity for a successful advance, or charge of cavalry. At present troops seem to be supposed to always have plenty of cartridges left.

It is notorious that an umpire is not, in very many cases, selected, because he is likely to be a good umpire. The reason is sometimes that he is a Captain without a squadron or a company, or a Major without a wing, or a Colonel without a command. Sometimes because he would otherwise have a command, for which he is not considered competent. Sometimes because he is utterly inefficient, and sometimes apparently for no reason at all. It is earnestly hoped that this matter will receive

the serious attention of the military authorities. Till it does so, more than half the use of camps-of-exercise is lost and the money spent on them wasted.

SECTION VII.

CAMPS OF INSTRUCTION.

89. The following instructions, compiled mostly from divisional orders, memoranda, etc., that have been issued from time to time at the various camps of instruction held under the Inspector-General of Cavalry in India, are published for the information and guidance of regiments and officers attending such camps in future.

Memoranda for Camps
of Instruction.

They are of course liable to alteration, to suit local requirements, by orders issued from Army Head-quarters.

The memoranda will be found most useful for small cavalry concentrations also.

MEMORANDA FOR CAMPS OF INSTRUCTION.

Scale of Baggage, etc., for Camps of Instruction.

(1) Regiments and batteries proceeding to camps of instruction are to move as lightly equipped as possible, transport only being allowed in accordance with the scale laid down in Field Service Equipment Tables. They may, however, take such portion of their

peace establishments as General Officers Commanding will provide for. British Corps will not be supplied with "general service" tents if "mountain service double-fly" tents are available.

In the case of movements by rail, all ranks are restricted to the scale of servants, baggage, etc., laid down in the Field Service Equipment Tables.

(2) Before leaving their stations a careful inspection of men and followers should be made in all regiments and batteries, and any men considered physically unfit should be left at the dépôt. But men who, though in hospital are only suffering from slight ailments, likely to improve on the march, should be taken.

Corps should take as many spare horses as they can so as to spare weak, very young or unsound ones at the camp.

Corps will take the authorised field medical equipment and, if considered necessary, the marching scale of hospital equipment also.

Marching scale of ambulance transport (clause 47, India, Army Circulars, 1887, paras. 5—8) will be taken by corps, at the discretion of General Officers Commanding.

(3) Field Service Marching Order will be taken.
Dress. No other dress will be required, unless specially ordered; officers to wear serge (or patrol) jackets and overalls at mess.

- (4) Blank ammunition at the rate of 20 rounds per man and 400 rounds per battery, will be taken by regiments and batteries.
- Ammunition.

Duties en route to Camp of Instruction.

- (5) "Pace alone furnishes a sure foundation for all our movements: distance and dressing in the ranks must be made to depend on it alone." Thus writes one of the greatest authorities on the training and employment of cavalry, and, in order to ensure uniformity of pace in the different regiments attending cavalry camps of instruction, every opportunity must be taken when marching to the rendezvous of practising the different rates of manœuvre, in column, etc., along the milestones which are to be found on most of the main roads in this country. Officers and senior non-commissioned officers should also be constantly practised in timing their horses from milestone to milestone at the regulation rates.
- Pace.

- (6) When brigades are rendezvoused to march to camps of instruction, Brigadiers should seize every opportunity of practising daily, when the state of the country passed through admits, all the simple movements that will be required of the brigade, when it forms part of the division. It is not to work as an independent brigade, but as one of the three lines forming a division, the principal movements required being long advances in line of squadron columns, in mass, etc., with changes of front on the move: occasionally during such changes
- Brigade movements.

opening out to deploying from close interval, or *vice versa*; long advancing in column, care being taken that the rear is not allowed to tail off.

No detached duties are to be practised during the march unless specially directed, nor are the movements above ordered to be so prolonged as to cause a loss of condition to the horses. Guards and orderlies during the march are to be reduced to a minimum.

(7) A party consisting of one British officer, with one non-commissioned officer and one man per half-squadron, will precede each regiment, arriving at the camp three full days before the date fixed for its assembly. They will report themselves to the Assistant Adjutant-General, and will be employed by him in marking out the lines, etc. The party must be provided with picks, shovels, and camp flags (including one for each officer's tent).

(8) Regiments and batteries are to enter their Entrance. camps by the front of their respective lines, moving round the flanks of the division, and will be careful to avoid crossing unoccupied ground that is reserved for other corps and batteries. Officers Commanding will be held responsible that their transport and followers are duly warned.

(9) Brigade-majors and adjutants and one officer from each battery will report themselves to the Assistant Adjutant-General at the divisional head-quarter camp and divisional camps one hour previous to the arrival of the troops.

(10) On arrival in camp regiments will send in a
Returns, present state of men and horses,
showing how many sick, and in
the case of horses the nature of the disease; a similar
return to be furnished on conclusion of the camp.

(11) Medical officers on arrival at the camp will
Medical Officers, report themselves personally to the
Principal Medical Officer.

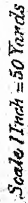
(12) Regiments warning the civil authorities for
Supplies, supplies must take, while in camp,
the full amount of their indents,
or be answerable for what is left on the hands of the
civil contractors in deficiency of the amounts indent-
ed for.

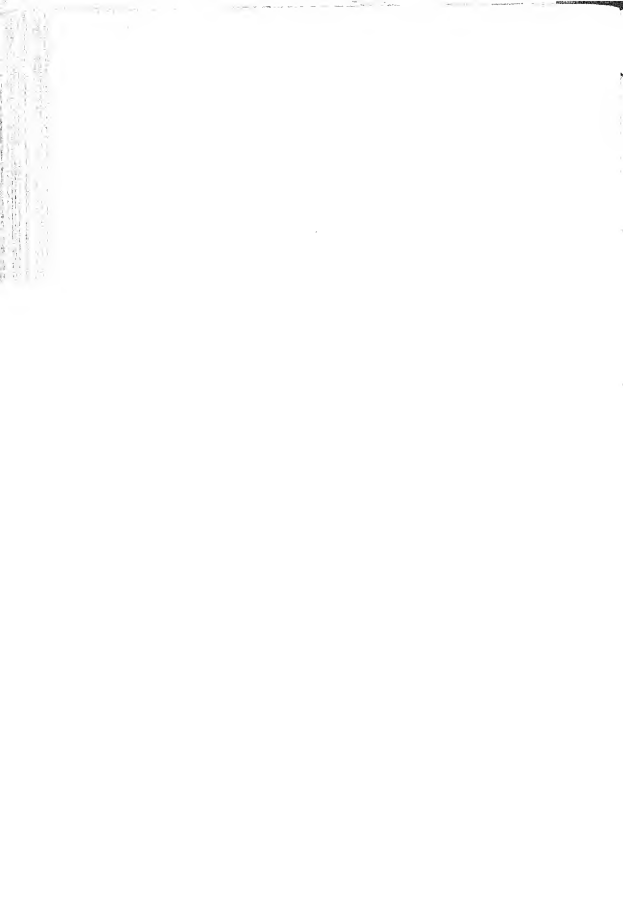
(13) If regiments wish to stack grass on their own
Forage, account either previous to (which
is generally very necessary) or
after arrival in camp, officers commanding will ascertain
from the Assistant Adjutant-General where the stacks
are to be placed.

Orders for Standing Camps.

(14) The camp is to be laid out with the utmost
Plan of Camps, precision and nicety on the plans
furnished from Army Head-quar-
ters (that for a single regiment is attached), slightly
modified to suit existing circumstances. Strict at-
tention to the following rules, in the first instance,
will probably save much trouble hereafter in striking
tents, altering picket pegs, etc.

CAMP FOR





As a rule, the camp of the division is marked out on the following system by a staff officer. A street, 30 yards broad, runs the length of the officers' tents from front to rear streets are allowed as under--

In centre of 4 squadron regiments, 20 yards wide.

 " " 3 " " *Nil.*

Between regiments .. 30 yards wide.

 " brigades .. 40 "

Grand centre of the division 50 "

The four corners of front and rear blocks are marked of the following dimensions :—

For Four Squadron Regiments.

Two front blocks, each 220 yards deep by 90 yards wide.

 " rear " " 75 " " 90 "

For Three Squadron Regiments.

One front block, 220 yards deep by 136 yards wide.

 " rear " 75 " " 100 "

For Batteries.

One front block, 220 yards deep by 100 yards wide.

 " rear " 75 " " 100 "

The outer pegs of quarter and rear-guard tents are 50 yards distant from the front and rear as so marked, and in the centre of regiments. The first duty of the colour party referred to in para. 7 is to spitlock the lines of each of their blocks

(20) European or native soldiers, servants or followers, are prohibited from using any other places than those selected and prepared as latrines and urinal for their corps. This rule will be strictly enforced by the regimental and camp police as well as by any extra means deemed necessary.

(21) A refuse-pit will be dug close to each latrine in which all the filth from each camp will be deposited. A Refuse-pits. sweeper is to be constantly on duty at these pits to cover any deposits with dry earth. New pits will be dug as often as the old ones become half full.

(22) Soldiers and camp followers should be cautioned against breaking bottles in or near the camp, and a severe punishment attached to neglect of this caution.

(23) Dung is to be separated from the litter, and the litter will then be spread over the centre and cross-streets of each corps. All corps in the right wing of the division will cover with litter the street between regiments to their left, and corps in the left wing the streets to their right. Corps immediately on each side of the centre will cover the grand centre street of the division.

(24) All remaining litter to be collected in front of quarter-guards and burned, or, if sold, to be removed at once.

(25) The cooking-places of British troops and
Cook-houses. Native officers must all be in line
and neatly kept; those of the
former will be surrounded by a low mud wall large
enough to include refuse-holes as well as the kitchens.

The cleanliness of cooking-places and their vicinity
is to be carefully looked to.

Pits, 4 feet diameter, 6 feet deep, for kitchen refuse,
will be dug close to each cooking-place, and all rubbish,
slops, etc., at once deposited in them. Dry earth will
be thrown over all deposits every evening and after
dinner. The above will also apply to messes and
canteens.

(26) Drinking-water is to be obtained only from
the wells told off for that pur-
Drinking-water. pose.

(27) Each regiment and battery will tell off either
a non-commissioned officer or a
Provosts. private for provost duty; these
men will work in pairs, viz., a European and a native,
and will work under the orders of the Deputy Assistant
Adjutant-General; names to be sent in immediately on
arrival in camp to the Assistant Adjutant-General.

(28) Tent kanats should be raised daily so as to
allow a thorough current of air
Ventilation of Tents. through the tents while the men
are on parade; and once a week at least the tents should
be taken down altogether for two or three hours, and
all bedding and kit exposed to the air.

(29) Bathing and washing will only be permitted at the places appointed for the purpose.
Bathing, etc.

(30) Horses will be watered under regimental arrangements at the places assigned to them.
Watering Horses.

(31) If hired transport, which arrives with British corps, is discharged on arrival, officers commanding will forward, as soon as possible, statements showing the probable amount of carriage they will require on the breaking up of the camp, to the Chief Commissariat Officer direct.
Transport.

(32) Camp post and telegraph offices will be established at the head-quarters camp.
Postal and telegraphic arrangements.

The hours for delivery and despatch of mails, and the working hours of the telegraph office, will be notified in Division Orders.

(33) Commanding officers will be good enough to issue stringent orders to grass-cutters forbidding the cutting of grass in and near camp. Men caught disobeying these orders will be punished.
Grass-cutters.

Grass-cutters should be warned that when going or returning from work, they must pass clear of camp to the front or rear, and not cross the streets of regiments on the right or left of them.

(34) Drains will be cut by corps in the direction pointed out by the Deputy Assistant Adjutant-General as soon after arrival in camp as possible. The drains which run across the cross-streets are to be made saucer-shape.

(35) Grass is to be issued only between the quarter-guard tents and the heels of the lines. All ground in front of the quarter-guard tents is to be kept absolutely clear.

(36) In case of fire all tents in the vicinity are to be immediately lowered and the men instructed to stand by, with blankets in their hands, to assist in smothering the flames.

(37) The Inspector-General will visit the camps of the division on the third day after the arrival of the troops.

Routine during the Camp.

(38) "Réveillé" at 6-30 A.M., "Watch-Setting" at 9-30 P.M., and "Last Post" will be sounded by regiments taking the time from a named regiment (the regiment nearest to both the head-quarter camp and the centre of the division). Trumpeters of batteries and regiments will be in readiness to sound off as soon as they hear the "fugle" regiment commence.

On "Réveillé" sounding, up to which time no movement will be permitted in camp, horses will be given their morning feed of grass and small feed of grain if

accustomed to receive it; lines will be swept out, litter removed, and fires lit in the cook-houses. Breakfast to be eaten by 7-30 A.M.; at this meal British soldiers should have at least 6oz. of their meat ration cooked for them; for dinners, as a rule, will not be had till late in the afternoon. At 7-30 A.M., horses will be fed. "Stables" will sound one hour before the time named for the brigade parade (usually about 9-45 A.M.), as the divisional parade will generally take place at 10 A.M.

On "Stables" sounding (and not till then) the *jhoods* will be removed from the horses, and grooming take place for 20 minutes. "Boot and Saddle" will then sound, and "Turn Out" 20 minutes later; this will give 20 minutes, ample time in a smart regiment, for squadrons to form up, be told off, and to march to their brigade rendezvous. There is no necessity for regiments to form up before joining the brigade. Squadrons can drop into their places whilst marching to the rendezvous.

It will not even be always necessary to form up brigades, for when the division marches off in column of route, squadrons will remain dismounted at the head of their lines till their turn comes to move off.

On such occasions it will always be notified in orders which brigade is to lead, so that Brigadiers can judge the time for turning out their own brigades.

(39) An orderly medical officer for the day will be detailed in division orders. This officer will not attend parades, but will attend to any case of emergency in the camp.

(40) One medical officer per brigade, accompanied by a hospital assistant, will attend all parades. The former to be detailed by the Principal Medical Officer, and the latter from the brigade to which the Medical Officer belongs.

(41) A veterinary officer, accompanied by a salutri, will attend all divisional parades. The former to be detailed by the senior veterinary officer of the division, and the latter from the brigade to which the veterinary officer is attached.

Guards and Orderlies. (42) The following guards will be given daily by regiments:—

	Non-Commissioned Officers.	Men.
Quarter-guard	1	3
Rear-guard	1	3
Tent guard, per half-squadron ..		1

(to be taken from the dismounted men or recruits or farriers.)

If any commanding officer does not consider the above number of sentries sufficient to ensure the safe custody of the men's kits that are left in the tents and lines, the kits must be packed as if the regiment was marching, and stacked by half-squadrons in front of the quarter-guard. For night duty quarter-guards will each be reinforced by six men for flank sentries; rear-guards by six men to provide a sentry each for the Hospital and Officers' mess if required. In British regiments, an additional sentry will be allowed for the canteen. One line sentry per half-squadron will also

be furnished. At camps held near the frontier, where thefts of arms are of frequent occurrence, commanding officers can, if they wish, stack their carbines at the quarter-guard under the immediate observation of the sentry, who should be armed with his lance or sword with orders to use his weapon if necessity arises. The men employed on night guard will be relieved at "Réveillé," and will turn out for parade with their regiments. A guard of one non-commissioned officer and nine sowars will be provided by regiments in turn for the head-quarter camp and be detailed in division orders.

All guards to mount daily at 6 P.M.

When the Royal Horse Artillery joins the division, the officer commanding will issue what orders he considers necessary for the guards, etc., the batteries will furnish.

One camel sowar from each Native cavalry regiment to be detailed for the head-quarter camp, to report himself daily at 7 A.M.

One camel sowar and one dismounted orderly are allowed for each brigade office.

Medical and veterinary officers will each be accompanied on parade by a mounted orderly, to be detailed from the brigades to which they belong or are attached.

The officer commanding the senior British and Native regiments of cavalry will each detail a trumpeter to attend the Inspector-General on all mounted parades; and the former will also detail an orderly to carry the General Officer's Commanding flag.

No other orderlies will be permitted without special sanction.

(43) The divisional commander requires three or four orderly officers, one for each brigade, and one for the horse artillery. Brigade commanders require two or three as the case may be.

Gallopers should be told off to the brigades or regiments that they are to gallop to during the day.

Routine Standing Orders.

(44) Senior medical officers present with brigades will, under the orders of the Principal Medical Officer of the camp, act as senior medical officers (as laid down in Clause III, India Army Circulars, 1892,) for their brigades.

(45) The senior medical officers of brigades will send one copy of the morning state of the brigade to the Principal Medical Officer by 10 A.M. daily.

(46) If field hospitals are not mobilized for the camp, corps will keep their own hospital establishments, and treat their sick in their own camps, as on the line of march. But care must be taken by judicious transfer of the sick to their own or adjacent stations to prevent overcrowding.

(47) Uniform will be worn by all officers attending the camp on duty, while in camp; this order does not apply to officers leaving the camp for shooting, etc. Officers not on duty at the camp are requested to appear in plain clothes during the manœuvres and drills of the troops.

(48) No galloping is permitted in the vicinity of the camp, nor is it allowed to move at a faster pace than a walk down the centre and cross-streets.

(49) Brigadiers will send in to the Assistant Adjutant-General, when necessary, the name of an officer who will act for the brigade-major, in the event of the latter leaving camp.

(50) All routine correspondence is to be sent through the staff of the district in which the camp takes place, only correspondence connected with the camp is sent through the Head-quarter Staff Inspector-General Cavalry's camp.

(51) No warrants nor forms E will be signed and issued by any one but the Deputy Assistant Adjutant-General, unless sanction is specially accorded.

(52) Officers are to address the Chief Commissariat Officer direct on all commissariat and transport matters; and instructions to the troops regarding these matters, which may be necessary, will be drafted by the Chief Commissariat Officer and submitted to the General Officer Commanding, and promulgated in due course.

(53) All Government hired carriage in possession of corps and medical officers, in excess of one *dooly* and four *kahars* (with two spare), is to be made over on arrival in camp

to the Chief Commissariat Officer ; as only the Cantonment scale of carriage is allowed while halted at a camp of instruction.

When Government carriage is required from the Chief Commissariat Officer, a responsible non-commissioned officer must be sent both to take it over and to return it. All officers to whom such transport is issued will be held responsible that it is properly treated and not overloaded.

(54) The issue of an extra $\frac{1}{4}$ lb. of bread per man for
Extra Rations. British troops (Army Regulations,
India, Volume V, para. 290), will
only be sanctioned under special circumstances at the
discretion of the General Officer Commanding.

(55) All grass-cutters of corps and of individual
Grass-cutters. officers, who have not made other
arrangements, must be furnished
with passes before being sent out for grass.

The passes can be obtained from the chief civil officer of the camp, who will inform applicants of the price charged per head and pony-load. Officers commanding British corps will first arrange with the Chief Commissariat Officer regarding the payment of this charge.

(56) All requisitions for coolies must be made to
Coolies. the civil officer at the camp in
writing, and must be accompanied
by cash at the rates laid down per coolie.

Manœuvres.

(57) Regiments will parade with squadrons of four troops each of minimum strength (19), unless otherwise ordered. This should give commanding officers opportunities of saving very young or weakly horses.

(58) Except during parade movements men are to rise in their stirrups, and horses to be ridden on the bridoon rein as much as possible.

(59) On divisional days two men bearing flags, either red or blue, will represent a squadron—red flags, 1st line; blue flags, 2nd and 3rd lines. Commanding officers must instruct their men when reconnoitring to report the number of squadrons they have discovered, not the number of flags.

Parties of less strength than a squadron must always retire before two of these flags, and on no account must the bearers be molested. This order must be strictly obeyed.

(60) When forces are opposing one another, the following rules will be strictly observed, *viz.*—

- (a) Swords are never to be drawn nor lances brought to the "engage."
- (b) Catching hold of men, their bridles or horses to make prisoners, is strictly forbidden.
- (c) Squadrons or lesser units must halt not less than 50 yards from each other, and twice that distance must divide larger bodies.

(d) No galloping, except for—

- (1) Urgent messages.
- (2) Formations to the front.
- (3) Last 300 yards of an attack.

(61) All parades will be in khaki (drill order, unless otherwise ordered).
Dress.

Water-bottles and havresacks are to be worn on all divisional parades and parades for manœuvres. A small feed to be carried on the saddle on all divisional days. Officers should always have their field-glasses, notebooks and maps.

At preliminary brigade drills men will turn out as light as possible; at divisional drills, swords or lances only are to be worn; at manœuvres, all arms are to be carried.

When the Divisional Commander or Brigadiers are about to give an order, they should call "gallopers," when the orderly officers will at once place themselves, so that when starting with their messages, they will not have to cross one another. Before starting they will each repeat the message they have to give to their respective brigades or regiments.

(62) Whenever a Brigadier or a Commanding Officer sees a galloper approaching
Conveyance of Orders. him to save time and horseflesh,
he should advance a short way to meet him; if necessary, make him repeat his order twice over.

(63) The excuse so frequently offered that a trumpet sound has not been heard cannot on ordinary occasions be accepted.

Trumpet Sounds and
Words of Command.

It is the duty of Brigadiers to arrange that the sounds from the divisional trumpeter are passed on to their brigades ; a second trumpeter posted half-way, or up wind, is all that is necessary.

Similarly, commanding officers must be held responsible by Brigadiers that their trumpet sounds reach them. Here there is no necessity for a trumpeter, as the commanding officer should, except when advancing to the attack, ride in the position in front of his regiment from which he can quickest get the command from his Brigadier and pass it on to his squadron commanders. Brigadiers will always give their orders when on the move by means of their orderly officers. Only when halted at close intervals are they permitted to work their brigades by word of command.

Brigade calls must always precede all trumpet or bugle calls sounded by Brigadiers, when working in division.

Brigades are to be worked as far as possible by signal. When a Brigadier is about to work his brigade by signal, he must see that the staff officers accompanying him do not ride so as to prevent his signals being seen by the officers commanding regiments, whose attention he will attract by sounding his whistle.

On hearing the whistle, commanding officers will look to their Brigadier, squadron leaders to their commanding officers, troop leaders to their squadron leaders.

The Brigadier must make his signal clearly and distinctly as laid down in Cavalry Regulations, page 212 *et seq.*, commanding officers passing it on quickly, if necessary, to their squadron leaders, who will also repeat the signal if it affects their squadrons.

All words of command must be passed on by squadron commanders, it being their duty not only to give the word to their own squadrons, but to make sure that the leader on the flank furthest from which the command came also gets it.

Brigadiers will repeat the divisional word of command, commanding officers only repeating the executive command coming from their Brigadiers, which will not be repeated by their squadron leaders.

Experience proves that it is necessary to remind officers that when an order is received directing a movement, say from a flank, it means from the flank of the body of troops under the command of the *officer issuing the order*; for instance, a galloper gives the order to the commanding officer of a regiment on the left of the brigade—"Advance in column of troops from the right." This, of course, means from the right of the brigade, not from the right of the regiment; if such were meant, the order would be—"Advance in column of troops from the right of regiments." When "Front Form" sounds, it means that each separate column forms to the front on its own head. Should a general line be required, the sound must be repeated a second time. For instance, a brigade is advancing in echelon of regimental wing or squadron columns, the "Front Form" sounds when each column will form to the front on its leading troop;

on the "Front Form" sounding a second time, each regiment, wing, or squadron in rear will come up at an increased pace into line with the leading regiment.

(64) When not required to manœuvre, bodies of cavalry should move with a broad front and open files especially

Marches,
should this be the case when in column of route. Marching in "fours," "sections," etc., should be avoided as far as possible. The column of troops with open files can generally be adopted in India; whilst in many places a broader front, such as open column of squadrons, with half extended or extended files, can be used with advantage to the comfort of men and horses, there being less dust, more air, and no straggling.

When there is open ground on both sides of a road, the squadrons can march echeloned on either side.

(65) When columns are advancing with a broad front, a staff officer or the officer

Obstacles,
in charge of ground scouts, should be sent well in advance to report when, and to what extent, it is necessary to decrease the front to pass an obstacle. On receiving such information, the head of the column should at once move on at a trot, the front being gradually decreased from the rear, which continues to walk. On passing the obstacle, the front should again be increased. The officer preceding the column, before sending word to the rear, should ascertain whether there are more ways than one of passing an obstacle. Often in India, where there is a bridge leading over a *nullah*, there are other places where

mounted men can cross. As soon as the officer has pointed out all the crossings, he must ride on ahead to send back, if necessary, further reports.

(66) Brigadiers will make previous arrangements for watering horses on field-days. No mules (*bhisties* or others) are to accompany regiments or batteries on parade.

(67) When men are runaway with on parade, they are on no account to wheel round to try to rejoin their corps, but are to ride straight to their front till they have stopped their horses. Commanding officers will be good enough to see that this order is thoroughly understood.

(68) Umpires during manœuvres will wear a white band, four inches wide, and assistant umpires a white band, two inches wide, on the right arm above the elbow.

Umpires will be furnished by the Assistant Adjutant-General with the general and special ideas of the manœuvres and orders thereon, and also with instructions regarding any particular points to be observed and reported on.

Formation of the Division.

(69) The division will generally march from camp in column of route ; but when it has to "rendezvous," unless otherwise ordered, it will be formed in column of brigade masses with 90 yards distance between the front of brigades, and will cover by the left.

The left regiment of the 1st brigade will furnish a covering base, and all regiments will mark the places where their flanks will rest. Brigade-majors, after seeing that the left markers of their brigades have covered on the divisional base, will dress their line of markers at the proper distance from those in front.

Batteries in line at close intervals are to form on the reverse flank of their respective brigades one on the outer flank of each brigade, the detachments to be in line with the head of the brigade.

Regiments and brigades will, as a rule, enter by the reverse flank moving in column, taking care that none of the markers are ridden over, and form up two horses' lengths in rear of their markers and dismount.

Batteries will not move into their positions till the cavalry portion of division is in its place.

When marching off in column of route, each battery and squadron will mount when it comes to its turn; in fact, every effort must be made during the manoeuvres to save horses from unnecessary fatigue, battery and squadron commanders being at liberty to dismount whenever their commands are not required for immediate action.

Ground scouts, one per squadron, are invariably to move out directly field movements commence.

Notice being given of the vicinity of the enemy, the division will be ordered to form in "preparatory formation."

Brigadier ——— Brigade leading.

——— Brigade echeloned on the right.

——— Brigade echeloned on the left.

The leading brigade will at once form brigade mass line of squadron columns or line of masses at deploying interval, the other two brigades each formed in brigade mass or column of masses following in echelon on either flank 200 yards to the rear, and from 50 to 100 yards outflanking.

Batteries, each accompanied by two wagons, will move in the vicinity of the division wherever the ground offers most advantages, as a rule, either on a flank or in rear of the leading brigade in such formation as will enable them to gallop out readily wherever they may be ordered.

The remainder of the wagons of the artillery division should be kept together under an officer, either in line or column according to the ground, and follow in rear of one flank of the cavalry division from 600 to 1,000 yards, conforming to the general movement.

As soon as the division assumes the "preparatory formation," combat patrols will be sent out to the front and flanks, each regiment of the leading brigade sending one patrol to the front, and each of the echeloned brigades one to the flank and to the rear. These patrols to consist of a section, and to keep not less than half mile from the body they are protecting, and are always to go out without any special order.

The position of batteries is optional to divisional commanders. For the working of horse artillery with cavalry, see Cavalry Drill, 1898, page 378, section XXXI. Also Field Artillery Drill, 1896, chapter I, section XVIII.

Although "brigade mass" is laid down, as the normal formation of the second and third lines for marching to the attack previous to the formation of a definite plan of attack, Brigadiers in command are at liberty, when the ground passed over is broken or very dusty, either to take half intervals or to form wing columns, care being taken that there is no greater depth or frontage than absolutely required.

As soon as the dispositions of the enemy have been reported, the most advantageous mode of falling upon him must be decided on from any order of formation including column of route. The batteries will then be ordered to advance.

After the front line has completed its manœuvring to gain the enemy's flank, *i.e.*, the flank farthest from the guns, the order will be given "Form for attack," when the line in rear of the exposed flank will, generally, be ordered to reinforce with a named number of squadrons. These squadrons will be taken from the inner flank of the brigade and will gallop up and join the leading brigade. The remainder of the brigade will then become the "support," taking full intervals either with all the squadron columns in line, or line of masses at deploying interval or regiments in echelon, or with the outer regiment in column of troops, or in such formation as may best meet the circumstances of the moment at 180 to 250 yards distance and 50 to 100

yards interval on the exposed flank. The other brigade, *viz.*, that echeloned on the protected flank, will be ordered to give a certain number of squadrons in direct support, *i.e.*, "succour" squadrons, the remainder dropping back to its position as the reserve, either covering the interval between the first line and the support, or echeloned on the protected flank from 350 to 400 yards distance and 16 yards interval from the leading brigades. As soon as the attack is delivered, all the lines in rear must halt at their proper distance and watch the course of events. Should the enemy break through the line, the succour squadrons which are scattered in rear of the leading line, on a rough line with the support and outflanking on the protected flank, will force him back.

The leader of the first line places himself in front of the centre of his line.

The place of the leader of the second line is in front of the squadrons which outflank the first line on the most threatened flank. He should ride on an alignment with the first line.

The leader of the third line is specially at the disposal of the division leader, and should remain in front of his own line.

The attack will generally be made against a marked enemy: flank squadrons therefore are not to "charge the air;" if no squadron is in front of them, they should be kept in hand, wheel inward, and attack the enemy in flank and rear. If, however, they find they are liable to be overlapped, they will drop into echelon, ready to meet a flank attack.

If the enemy is repulsed after the shock and *mêlée*, and a pursuit is ordered, it will be carried out vigorously by the engaged line, except the squadron of direction of each regiment which will rally and follow in support.

The retreat of the troops engaged in the *mêlée* must be conducted in as orderly a manner as possible, and the utmost endeavours must be made to conduct the troops direct to the rear until they have passed the rear lines advancing to their support. In any case they must be led in such a direction as will prevent their masking the fire of the artillery and will enable them to be rallied under its cover.

In all formations to a "rally" the men will form line at once independently of their position in "fours," and will be told off again when an opportunity occurs.

All rallies to be first by squadrons to the direction named, then form regiments, afterwards brigade, if ordered.

(70) The following, though the normal formation for the cavalry division when it practises the movements necessary to screen the advance of its own army corps, whilst at the same time endeavouring to discover the position of the enemy, will be considered optional:—

In the case of three brigades in the division two
 Reconnoitring and Screening Duties. brigades will be in advance marching by parallel routes from 6 to 7 miles apart, the third brigade (heavy) following as a reserve about 3 miles in rear of the centre.

Each of the advanced brigades detaches a regiment 2 or 3 miles to the front, which will assume the reconnoitring formation directed at page 288 *et seq.*, Cavalry Regulations.

The squadrons thus thrown into the advanced line will cover the whole of the front that has been assigned to the division, *viz.*, from 6 to 12 miles in enclosed country, and from 18 to 20 when very open or well provided with parallel and lateral roads.

These squadrons will move about 4 miles in advance of their respective brigades, the head-quarter squadron of each regiment following about 2 miles in rear of its centre advanced squadron.

Constant communication must be kept up by the advanced squadrons with their head-quarter squadron and with the brigades in rear, as also lateral communication with one another.

Thus the division forms, as it were, three lines :—

the *first*, consisting of the advanced squadrons and their supports ;

the *second* of the advanced brigades ;

the *third* of the heavy brigade in reserve,

the distance from the first to the third line being from 7 to 8 miles.

In advance of the whole will ride such special patrols as the commander of the division may consider necessary. These will consist, as a rule, of one officer and a section ; they will be taken from the reserve brigade

and will receive their orders direct from the General Officer Commanding. Information furnished by them will be sent direct to that officer.

The horse artillery will accompany the reserve brigade, unless otherwise ordered. During the march each unit will protect itself by advanced and rear-guards and flankers.

The division in this formation must be prepared to march 30 miles a day, and to keep up that rate for at least three days.

The day's march will generally be conducted as follows :—Orders having been issued to that effect on the previous night, the lines will start one hour after daybreak, previous to which the advanced squadrons will report to their brigades anything that has happened during the night, the information being passed on to the divisional leader, who will bivouac or encamp with the reserve brigade.

The detailed order of the previous evening will probably direct each of the lines to advance about 6 miles to certain places or squares on the map, where half-an-hour's halt will take place. The advance will then be continued for about another 6 miles, when after another short halt, to allow of communication taking place, the advance will be continued for 6 more miles, when a two hours' halt will take place, during which, if there is no enemy near, horses may be watered and fed, girths loosened, and in some cases a portion of the horses unsaddled, and the men take some refreshment. On the march being resumed, the advance will continue for about 6 miles, when, after a

short halt, the line will continue its advance to the position it is ordered to occupy for the night, when the advance troops will, unless they receive orders to the contrary, form themselves into an unbroken line of "march outposts." In arranging the different halts, the orders should state the hour the squadrons are expected to arrive at their several halting-places, and the hour at which they are to continue their march. The officer issuing the orders should regulate the orders for the march, so that the different halts take place, if possible, at places where horses can be watered. No feeding, loosening of girths, or unsaddling will take place until the reports from the front have come in. At each halt lateral communication will take place between the advanced squadrons and reports sent to the rear to head-quarters of regiments, by which they will be passed on to their own Brigadiers and to the Divisional Commander, whose whereabouts at each hour during the advance will be notified in orders. Should circumstances prevent the General Officer Commanding being at the different places at the time named, a staff officer must be sent to them to receive and forward reports.

The rate of march will, as a rule, be about 5 miles an hour, so that (including halts) a march of 30 miles will be conducted in about 9 hours.

Dandies and ambulances will follow immediately in rear of brigades. The medical officer of each brigade will send forward such portion of the sick carriage at his disposal as he may think necessary with the head-quarter squadron of the advanced regiment.

The transport will be concentrated and marched on a line to be fixed daily by divisional commanders.

Brigadiers of the advanced brigades will, after the halt for the night, establish connecting posts between their advanced regiments and also with the reserve brigade.

This latter brigade will at all times keep up a line of similar posts between the division and the army corps following.

The particular attention of all ranks is drawn to page 283 *et seq.*, Cavalry Regulations.

(71) The maps used in cavalry reconnaissance should be ruled in squares, printed with the map, if possible. Each square to be numbered and lettered.

(72) The field report-book used should (like a cheque-book) permit of a message being written and torn out, and a record kept on the counter-foil of the page.

All reports should be sent in open envelopes. Army Form C-398 (see below); and the latter should be returned receipted, those of a confidential nature only being sent closed, and marked so :

<u>Army Form C-398.</u>	<u>Date</u>			<u>Rate.</u>
<i>Despatched</i> <i>h.</i> <i>m.</i> <i>M.</i>				<div style="border: 1px solid black; padding: 5px;"> 6 miles an hour. 8 to 10 miles an hour. As fast as possible. </div>
<i>Received</i> <i>h.</i> <i>m.</i> <i>M.</i>				
<i>Signature of Receiver.</i> }				

This envelope to be returned to bearer.

Similar report-books and envelopes should be printed in the vernacular, for the use of native officers and men unable to read English.

(73) Patrol and other commanders when sending Reports. in their reports must invariably be guided by the instructions contained in Cavalry Regulations, pages 295 (f), 310 and 312. They should, moreover, judge as accurately as possible where the persons addressed will be at the time the reports can reach them, and the bearers must be directed accordingly. Otherwise important information will arrive late and horses will be unnecessarily used up.

The particular attention of all ranks is called to this order. A little hurry or carelessness, or the want of a penknife to sharpen a pencil, is often the cause of reports being perfectly illegible.

Squadron leaders should, if possible, each have a writer to accompany them in the field, who could, on an emergency, write and despatch reports dictated to him.

(74) Divisional and brigade commanders should tell off a staff officer to keep a Diary. diary of the reports and make out hourly a statement of the situation. He will also be prepared to point out on the map at any time the approximate positions occupied by the different units of the opposing forces.

A vernacular reader should be detailed to accompany this officer.

SECTION VIII.

FIELD SERVICE EQUIPMENT.

90. To say that our Indian Cavalry regiments are too lightly accoutred for some descriptions of war service, whilst being at the same time too heavily encumbered, seems paradoxical, but is nevertheless true. "The Field Service Equipment Tables, 1888," were closely modelled on the "Kabul Scale, 1878—80," being thus framed on the supposition that the regiments would form a portion of a large force designed to remain in the field for some months, and possibly for a year or longer: the allowance of one baggage mule per every couple of sowars was, with universal approval, cut down in 1888 to one mule per every three sowars, and by the happy expedient of presenting 87 Government mules to each Silladar regiment in perpetuity, it has been rendered independent of the Commissariat Transport Department as regards requisitioning for obligatory pack-mules when ordered on active service. We may take it for granted that not a single pack-animal has been allotted to Silladar regiments in excess of the number which the maintenance of efficiency during a lengthy

campaign requires. On the other hand, it may be desired occasionally to employ cavalry for short periods in the field, and there is reason to believe that insufficient provision has been made for this in the Tables of 1888. For two or three weeks' trans-frontier campaigning, native cavalry regiments can surely dispense with such items as a "three months' supply of stationery and Quartermaster's necessities," and even with tents, forge, saddler's and armourer's shops. Sowars, if they hope to gain the Indian Medal of 1895, must be prepared, like the sepahis, to take the field for a fortnight or so, practically in what they can carry on the person. Doubtless they desire, and may even be prepared to do so, and the officers may be of opinion that such an arrangement is generally understood, but no provision is made for such a case in the Equipment Tables of 1888. For example, let us suppose that it is a question, if 400 sabres can accompany the infantry in a short "dour" into a trans-frontier region where supplies cannot be procured readily, if at all; and that the force is required to march with as little impediment (of followers and baggage and supply pack transport train) as possible. The officer detailed for the command of the mixed force may be accustomed to form his own judgment on such questions, and turns to the books of regulation to see if what is laid down for the sowar to carry on his person or his horse, in "Service Marching Order," will enable him to take the field without an attendant baggage mule (1 to 3). He finds that according to the equipment tables the sowar is not equipped with that object in view. He next consults his Commissariat Officer as regards the supplies the cavalry will require, and his ability

to furnish them: this officer has only official cognizance of the equipment tables, and turns to them to find that the employment of 400 sabres means about 400 men, 400 horses, 250 baggage mules, and 250 followers; he knows these will require about 70 maunds of rations per diem; for the Silladar cavalry is dependent on the Commissariat Department, on service, for the rations of men and followers, and the grain ration of horses and mules; he calculates that he must provide some 250 additional two-maund-power animals to carry a week's supplies for the above, and where every mouth which eats has to be strictly reduced, his reply can hardly favour the employment of the 400 sabres. Where some 50,000 transport animals are put into the field, 1,000 even may be allotted without difficulty for the purpose of bringing up the rations of a cavalry regiment, but with a small force the case is different, the lines of communication are very often insecure, and the staging system of employment of transport impossible. Silladar regiments should require little training to become good foragers, and can even use their own baggage mules to forage from the camps, but requisitioning for supplies in European towns is one thing, and foraging in Eastern hostile countries quite another, so that few commanding officers would be able to give a guarantee of their ability to support their regiments by foraging operations. To do this was possible in Swat in 1896, or Egypt in 1882, but not in Suakim in 1885. The question must be decided separately on each occasion of employment, but the first question to be considered is, if the sowars can take the field independently of their baggage mules?

The Equipment Tables of 1888 lay down that the sowar is to carry as follows :—

Carried on person (that is, on man or on horse).	Carried on mule.
One turban, one kamarband : arms, accoutrements, and ammunition ; khaki pyjama and blouse, warm under-clothing, boots, putties, socks, mittens, great-coats, spurs. Farriers to carry 1 pair veterinary wallets per squadron.	Spare turban, kamarband, khaki pyjamas and blouse : Cardigan jacket, change of under-clothing, waterproof sheet, blankets (two in cold season, one in the warm season), boots, socks, holdall, small sheet or towel, tent, cooking-pots, line gear (i.e., jhools or horse blankets, horses' picketing gear and ponies' gear) and the grass-cutters' kit.

The Regulations are not very explicit as to what constitutes the order known as " Marching Order " for the Native Cavalry ; they say the sowar is to wear a " serge " blouse, cloak, " etcetera " (the etcetera here is exceptionally vague) on wallets, horse blanket and picketing gear behind saddle, picketing reins and havresack—all these articles being carried either on the person or on the horse.

The Manual for the Bengal and Punjab Cavalry simply refers one to the Regulations. Which is it to be—" khaki or serge clothing ? " Are the blankets and picketing gear to be carried on the horse or on the baggage mule ? And is the farrier to have no tools wherewith to put on a shoe ? Are water-bottles and canteens forbidden ? Commanding officers have doubtless rectified the omission ; but is there uniformity

throughout the service, and is the "Marching Order" thus evolved, calculated for parade purposes only, or is it designed to make the sowars independent on service? It would appear that in this respect the British cavalryman is better equipped than his native confrère.

My own opinion is that, to be quite independent of his mule, the sowar should carry on his horse or his person the following articles:—Turban, kamarband, arms, accoutrements, ammunition (40 rounds ball), khaki breeches, spare do., pyjamas, one blouse (drill or serge) according to season, flannel shirt, socks, cloak and cape: cloak to be wrapped in a semi-waterproof horse-sheet (*gardani*): cape to be wrapped in a sheet of similar material (*bokbund*): the *gardani* and *bokbund* being used also to wrap up the saddle and to place over the horse when in camp, poshteen (for cold regions), water-proof sheet and one blanket for man, one blanket for horse, shoe cases, spare shoes and nails (Farriers to have tools and medicines), water-bottle, one pair spare native shoes, two dusters, oil-bottle, hoof-pick, canteen, picketing gear, horse-brush and comb, haversack, towel and soap, matches, two haynets, nose-bag, tin for ghee, small axe, drinking cup and bowl. There should be no difficulty in arranging for this, and also for his carrying always with him one day's rations for himself and horse. Having tested our arrangements to make the sowar thoroughly independent personally of his mule, by sending out a party for three or four days under service conditions, as is done at Aldershot, and having satisfied ourselves that they are satisfactory, we should then experiment with a view to ascertaining for how many days Silladar regiments can keep the field,

and how far they can proceed from a base if left to make their own arrangements, and given neither supplies of grain, bhoosa, etc., for horses or mules, nor food for men or followers; the country being supposed to afford supplies of fuel and water only: only the mules accounted for on the rolls of the regiment to be taken into camp or used: the line of communications are supposed to be unsafe for a party smaller than a regiment, and the difficulties of the road limit the length of the march daily to from 10 to 15 miles. I have thus selected a set of conditions the most unfavourable possible to cavalry, and the answer my calculation gives is, that a Silladar cavalry regiment acting independently should be able to proceed in a forward direction for five consecutive days to a point 60 to 75 miles from the base, returning to the base by two double marches, thus keeping the field unaided for a week. The mules would have to carry three maunds each for the first day and a few of them on the second day; after that, as the loads become consumed, mules will be available for the followers to ride on; each horse might be allowed four seers gram and four seers bhoosa daily (this quantity can be carried in the nose-bag and haynets); the mules are allowed two seers gram and four seers bhoosa, and men and followers full rations. In conclusion, it would seem that Silladar regiments have only to prove that they can keep the field unaided to increase.

91. The following method of carrying the kit
 Method of carrying in "marching order" should be
 equipment in "March- adhered to, viz :—
 ing Order."

(1) The cloak to be rolled, not more than 26 inches in length, with a waist in the centre, to be fastened by

the centre cloak-strap to the cantle of the saddle, as high up as possible, so that the centre is quite clear of the horse's back.

(2) The cape to be rolled not exceeding 32 inches in length and carried in front of the wallets, so that the latter may be opened without moving the cape. The buckle of the centre strap not to be on top of cape but low down in front.

(3) The horse blanket should be 5 feet 5 inches square in size. It should be carried between the numdah and the saddle. The front part of the numdah should be raised into the arch as much as possible by means of a leather loop on the former fastened to a ring on the latter, to prevent the blanket from shifting and to save the horse's withers. The blanket should be folded rather smaller than the numdah; and the folding modified to suit horses of peculiar conformation. The two ordinary ways of folding the blanket are as follows:—

(1) Lengthways "in three" and then to double over one end 24 inches and turn the other into the pocket formed by the folds, the blanket thus folded being placed on the horse's back with the thick part near the withers.

(2) Lengthways "in four" then double and lay it across the horse's back so as to lie between the arches of the saddle.

No. 1 Method permits of the stuffing of the pannels being reduced to a minimum or even being entirely dispensed with if saddle-trees fit well.

No. 2 Method is less likely to allow the blanket to shift; and, moreover, confines it strictly to the weight-bearing surface of the horse's back. But when horses fall off in condition it is not as useful as No. 1.

(4) In the event of its being necessary to carry a blanket for the sowar, it will be placed over the saddle and secured by the sureingle.

(5) The head-rope, 10 feet long, to be rolled up into the correct length for linking horses, *viz.*, one yard: one end to be fastened by buckle on the ring of the breast-plate and the other to be looped to the lower ring of head-stall.

(6) Heel-rope, 6 feet long and single, placed on the top of the cloak inside the nose-bag when empty, and on the top of it when a feed is carried.

(7) The gram-bag should be large enough to carry a day's feed (those made of black goat's hair are the best) and should be fastened by two side cloak-straps. In those regiments that use small nose-bags and carry their gram, the corn sacks to be carried above the cloak like the haynets.

(8) Haynets if double can be supported by the cloak-straps, one haynet being carried on each side behind the saddle well up as near the saddle as possible so as not to swing; or if single, fixed on the off side, to the back arch of the saddle in a similar manner to the carbine bucket.

(9) Picketing pegs to be made of iron (standard pattern). They are carried in one of the following ways, *viz.*, one in each wallet if the latter are big enough; or in a small leather case along the front of

the wallets and attached to them by straps under the cape so that the hand be not injured in coming in contact with the pegs, or they are kept with the heel-rope.

(10) Water-bottle is carried on the sowar.

(11) Chagul when used to be carried under the horse's belly, slung in a net. It should be slung through the saddle between the tree and the cantle, and not over the seat of the saddle, which causes it to hang too far forward and catch the rider's spur. It should just touch the horse's belly when adjusted; it will thus hang clear of the belly when the saddle is pressed down by the rider's weight.

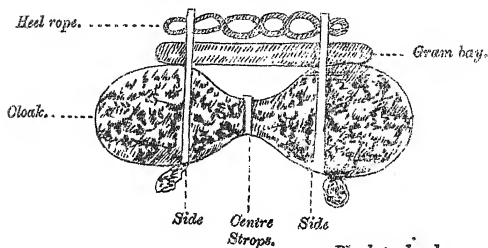
(12) Canteen if used, to be strapped on to the side of the near wallet.

(13) The havresack to be carried on the left side, the strap passing over the right shoulder under the pouch-belt. When not used for carrying provisions, it will be neatly folded and fastened with a button and hung square across the man's side, the lower edge in line with the elbow.

(14) In Lancer regiments a loop should be sewn on to the girth on the off side through which the butt of the lance is placed into the off bucket when dismounting by sections with carbines, the lance being kept steady either by a strap on the off wallet especially sewn on for the purpose, or by one of the cloak-straps.

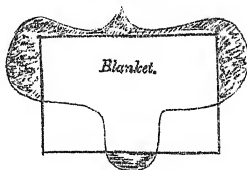
Method of carrying cloak, heel-rope, and gram-bag.

*Method of carrying
cloak, heel rope, and
Gram bag.*

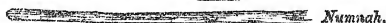


*Blanket placed
on numnah.*

*Front view of blanket ready
folded to place on numnah.*



Blanket.



(15) Wallets will be packed only in marching order as under:—

Near Wallet.	Off Wallet.
Horse-brush. Currycomb. Hoof-picker. Tin of blacking. Brushes, boot and cloth.	Change of clothes, etc.

(16) The shoe case will be carried on the near side and should contain two shoes (one fore and one hind) and nails that have been previously fitted to the horse. It should be supported by a pad so as to hang perpendicularly.

(17) The sword will be carried suspended through a ring of leather on outside of shoe case, when not going into action.

(18) The carbine bucket fastened to the back arch of the saddle on the off side should hang perpendicularly and well back from the man's spurs.

COST OF EQUIPMENT.

92. The Silladar system on which all Native cavalry (except Madras) are worked, is briefly as follows:—The sowar should bring from 450 to 500 rupees as so much invested money, to provide a fund as a working capital, called the Regimental Fund, to purchase a horse, saddlery and uniform. His pay is supposed to be calculated to represent a fair interest on this money and his wages. When he takes his discharge, he gets back his regimental fund, and his horse price in full, and the value of his saddlery and uniform as assessed by a committee; and, his whole *assami*, as it is called, is taken

over by the in-coming recruit. If while on active service his horse should be killed, and the saddlery cannot be recovered, he gets compensation from Government for horse and saddlery according to rules laid down. Such compensation is drawn by the regiment, that for the horse credited to the Chanda Fund, and that for the saddlery to his personal account, through the store account.

In 1889 the Commander-in-Chief in India called the attention of Commanding Officers of Native Cavalry Regiments to the necessity for procuring articles of equipment with due regard to the men's pockets; and, moreover, circulated a statement giving the maximum prices to be paid for new articles without previous sanction of Army Head-quarters. These prices were arrived at by taking the mean cost of each article of equipment in possession of the Bengal and Punjab Cavalry at that time. Although this restriction has since been withdrawn, and commanding officers of regiments have now a free hand as before, still the statement must be regarded as a guide to them for the future.

MAXIMUM COST OF EQUIPMENT.

UNIFORM.

				Rs.	a.	p.
Cloak and cape	..	..	..	20	0	0
Serge blouses, each	..	..	..	7	8	0
Kamarbands, „	..	..	..	1	4	0
Loongies, „	..	..	..	2	12	0
Kullas, „	..	..	..	0	10	0

			Rs.	a.	p.
Pyjamahs, yellow, per pair	..	..	1	12	0
Breeches, Corduroy ..	..	..	5	8	0
Putties, per pair ..	..	..	1	2	0
Khaki blouses, each	..	..	3	0	0
Do. pyjamahs, per pair	..	..	1	8	0
Shoulder-chains, ..	..	..	3	0	0
Numerals, per pair ..	..	..	0	8	0
Long boots	..	..	8	0	0
Ankle-boots	..	..	5	0	0
Gurgabis	..	..	1	10	0
Spurs with oot-chains	..	..	1	8	0
Poshteens	..	..	5	4	0
Havresack	..	..	1	0	0
Sword-knot	..	..	0	4	0

ARMS.

Sword	..	..	12	8	0
Lance	..	..	7	0	0
Do. pennon	..	..	0	6	0

ACCOUTREMENTS.

Mackenzie equipment	..	..	8	0	0
Water-bottle	..	..	1	2	0
Canteen	..	..	1	8	0
Share of tent	..	..	12	0	0

SADDLERY.

Saddle, new pattern, English tree	..	..	27	8	0
Pair numdah pannels..	..	..	4	8	0

			Rs.	a.	p.
Numdah (English) .. ..	..	..	6	8	0
Pair wallets and wallet-straps ..	..	..	4	8	0
Breast-plate (Hunting pattern) ..	..	..	2	0	0
Leather girth .. ..	..	..	2	0	0
Surcingle .. ..	..	..	1	4	0
Pair stirrup leathers .. ..	..	..	2	0	0
Do. do. irons .. ..	..	..	1	12	0
Carbine bucket .. ..	..	..	4	0	0
Pair shoe cases .. ..	..	..	2	8	0
Picketing-rope (<i>bagdor</i>) .. ..	..	..	1	8	0
Bridle complete .. ..	..	..	7	8	0
Chain rein and poll chain .. ..	..	..	3	4	0
Cloak-straps and baggage-strap, each ..	..	..	0	4	0
Canvas Chagul, with net .. ..	..	..	1	2	0
Saddle cover (<i>bokbund</i>) .. ..	..	..	2	4	0
Pair lance buckets .. ..	..	..	1	8	0
Grain bag (goat-hair) .. ..	..	..	0	8	0
Corn sack (canvas) .. ..	..	..	1	12	0
Grass-net .. ..	..	..	0	4	0
Leather case, for iron pegs .. ..	..	..	0	12	0

STABLE GEAR.

Watering bridle .. ..	..	..	1	4	0
Head collar (<i>nukta</i>) .. ..	..	..	2	0	0
Head and heel ropes.. ..	..	..	1	4	0
Picketing pegs, iron, each .. ..	..	..	0	5	0
Leather nose-bag .. ..	..	..	1	14	0
Hair nose-bag .. ..	..	..	0	8	0
Stable bucket .. ..	..	..	1	0	0

			Rs. a. p.		
Blankets, each	4	0 0
Jhool	5	8 0
Body-roller	1	2 0
Eye-fringe	0	4 0
Horse-brush	0	12 0
Currycomb	0	4 0
Hoof-picker	0	2 0
Burnisher	0	6 0
Mane comb	0	3 6
Coir rubber	0	2 0
Shoes and nails	0	12 0
Full gear of baggage animal	15	0 0

N.B.—The pay of all ranks has been increased since the above rates were fixed.

STANDARD PATTERN OF EQUIPMENT.

93. On reference to a letter from Messrs. Cooper, Allen & Company, Agents, Government Boot and Army Equipment Factory, Cawnpore, dated 26th March 1894, *vide* page 235, it will be seen how the necessity for a standard pattern of equipment for the native cavalry was pointed out, and the proposal for a committee of native cavalry officers to assemble, to decide this question was approved by His Excellency the Commander-in-Chief in India. The proceedings of the committee which assembled at Cawnpore on the 15th January 1895, are given below in full as an interesting and most important guide.

Proceedings of a Special Committee assembled at Cawnpore on the 15th January 1895, by order of His Excellency the Commander-in-Chief in India, to inspect and report on the various patterns of saddlery and equipments in present use in the Cavalry of the Native Army; and to decide on a pattern, which may hereafter (if approved) be the recognised standard pattern for all regiments of Silladar Cavalry.

PRESIDENT :

Lieutenant-Colonel F. C. BURTON,
Commandant, 2nd Bengal Lancers.

MEMBERS :

- Major C. W. MUIR, C.I.E.,
Commanding 17th Bengal Cavalry.
- Major H. M. MASON,
Commandant, 4th Lancers, Hyderabad Contingent.
- Major E. J. F. WOOD,
Commandant, 10th Bengal Lancers.
- Captain A. PHAYRE,
3rd Bombay Cavalry.
- Captain H. I. E. PALMER,
5th Punjab Cavalry.
- H. LEDGARD, Esq.,
Firm of Messrs. Cooper, Allen & Co.

The committee assembled at the Government Boot and Army Equipment Factory (Messrs. Cooper, Allen &

Co.) at 10-30 A.M., and proceeded to read the order of His Excellency the Commander-in-Chief in India concerning the same and the correspondence therewith attached.

(2) Officers commanding all regiments of Silladar Cavalry in India were addressed in a memorandum by the President, and invited to send in any suggestions which might help the committee. The replies before the committee are read.

(3) On inspecting the saddles of the several regiments on view in the sample-room of the factory, the committee is struck with their general similarity, and find that with a few exceptions regiments have adopted the angle steel arch tree, and but few are in possession of the wooden arch and cantle. The great difference, therefore, does not exist in a diversity of patterns of saddle so much as in the points of minor detail.

Before, however, entering into these points of detail, the committee has fully discussed the advantages to be gained by recommending the adoption of the Austrian saddle, or a modification of it, which has been in use in England, and which from reports appears to have given satisfaction. Its present price would debar all regiments of Silladar cavalry from adopting it, £7-17-6 being more than any regiment could afford at the present rate of exchange. Reports are also before the committee of some regiments of Hyderabad Contingent who have tried the Austrian saddle and have not approved of it. For the above reasons, therefore, the committee will not entertain this saddle in its propositions. Each saddle

now in the sample-room will be examined in detail and the differences that exist noted; and the committee trust, by selecting the best points in each, to combine the features in one saddle which may hereafter, if approved by His Excellency the Commander-in-Chief in India, be the standard pattern for all regiments of Silladar cavalry.

The change to be effected must be a slow one, as many regiments have only lately been equipped; and further during the years to come there may be improvements which it would be desirable to take up, so that the standard pattern would alter possibly in some degree from that now recommended.

The committee would also desire to record that although it has been assembled at the suggestion, in the first instance, of the firm of Messrs. Cooper, Allen & Co., and they have afforded facilities for going thoroughly into the question, and further that they have had the valuable assistance of Mr. H. Ledgard, a partner of the firm, in coming to their decision, it should be quite understood by regiments that the firm wish in no way to claim the exclusive right of making the standard pattern of saddle and equipment, and they will be prepared at all time to help regiments who consider they can get the work done at a cheaper rate in the open market.

Appendix "A" deals with the various points of the saddle: its composition, the tree, various sizes, pannels, slope of cantle, girth attachment, etc., etc.

Appendix "B" deals with the horse equipment, headstall, breastplate, girths, bits, etc., etc.

Appendix "C" has reference to the equipment of the sowar, his belt and mode of carrying his carbine.

The following points, though mentioned in the attached appendices, appear to call for further explanation, as they

Pannels.

have always been sources of discussion and of doubt, both at home and abroad, and the committee beg to record their opinion with all deference on these points.

Pannels, as in use at the present time, are made either of long strips of felt, or stuffing of horse-hair mixed with flock. From the reports before the committee, opinions, as to which is the better, are very equally divided. Some few years ago, felt pannels were all in use—a prejudice having arisen against the use of the thicker stuffed pannel; but many regiments have returned to the stuffed pannel and gone to the other extreme, *viz.*, of having the pannel not sufficiently stuffed. The committee is also equally divided in its opinion as to which is the better for general adoption, and it would point out that as either pannel is of a perishable nature, no firm would ever keep it in stock as a "store article," and as both materials are easily obtainable, they would beg to recommend that pannels be left to regimental arrangements.

Blankets have, for the past few years, been recommended to take the place of the pannels, and it is believed they are

Blankets.

now in general use in the British Cavalry and Artillery in this country, and no doubt valuable information will soon be forthcoming as to their advantage or otherwise. Some regiments on the frontier have also taken the blanket into use, but this committee think that it must

always be a drawback for Silladar cavalry on the score of expense. Its constant use on orderly duty in stations and therefore necessary expense in up-keep, as no commanding officer would care to see the orderly of his regiment turned out with a frayed blanket, and therefore men would in most instances be obliged to keep up two of these blankets, added to which it would soon become useless as a means of giving covering and warmth to the horse, which is claimed as the chief desideratum for its use on service.

There are at present five separate sorts of girth attachment in use in Native Cavalry regiments as follows :—

1. The straight attachment rivetted to the side bar.
2. The attachment on runners going round side bar.
3. The staple attachment.
- 4 & 5. The "V" attachment with and without fore-buckle.

Each has got its supporter, but there is little doubt No. (1) is the best of the five, and it is believed is now again coming into use with the British Cavalry.

No. (2) is likely to gall.

No. (3), the staple rubs the rider's leg and wears the saddle flap.

Nos. (4) and (5) require extra long saddle and flaps, and it is a question whether any advantage is gained by the use of the fore-buckle in changing the position of the girth. The committee has recommended the

straight attachment, and it is supported in its recommendation by the experts of the Government Harness and also Equipment Factory.

In concluding this report, the committee would wish to call attention to a saddle with a perforated steel side bar which has lately been issued to the 2nd Bengal Lancers.

The tree is steel throughout. The side bars are made of the finest saw steel. The committee attach a report on it from Colonel Burton. The saddle has been in use in the regiment for some 20 months and has proved so far a success, and this committee thinks it might be given a trial in all regiments, who may now be requiring new saddlery and a report furnished on it after a thoroughly fair and severe test.

APPENDIX A.

Composed of fore and rear arch and two side bars.
The Saddle-tree. The arches to be made of mild angle steel, and in the following sizes :—

Width point to point fore-arch.	Width points of fork of fore-arch.	Width of side bars under rear-arch.	REMARKS.
5½ inches ...	10½ inches ...	6	For large horses and walers.
5¾ " ...	11½ " ...	6½	
6 " ...	12 " ...	6½	
6¼ " ...	12½ " ...	6¾	

The fork to have two slots for the wallet-straps, but no slot in the head of the arch.

To have a high cantle, $3\frac{1}{2}$ inches, the distance from head of fore-arch to centre of rear-arch. rear-arch to be 18 inches, so that the seat, when fitted, will not be less than $17\frac{1}{4}$ inches.

The distance from point of fork of fore-arch to angle of rear-arch where it joins side bar to be $15\frac{1}{2}$ inches. With these two measurements we arrive at the slope of the cantle.

Cantle. The cantle to have two small rollers for the cloak-strap.

Slots in rear-arch. The rear-arch to have one slot on each side for the outer baggage-straps.

Struts or supports. Struts not required on the rear (angle steel) arch.

Side bars. To be made of thoroughly seasoned wood, 21 inches to 22 inches long, and with a curvature of $1\frac{1}{8}$ inches in that length.

The arches to be rivetted to the side bars with 12 rivets, *i.e.*, 3 rivets in each bar in front and 3 in rear. The end of the side bars, projecting beyond the fore-arch, known as the burrs, to be cut flush with the fork of the fore-arch, and the burrs, to be formed of steel projections, well curved upwards, to clear the play of the shoulder and fitted with a loop and D, the former to fasten the breastplate and the latter as a wallet attachment.

Stirrup attachment. The stirrup attachment to be as follows :—

An iron square revolving on a small band of steel, which is rivetted to the side bar, the lower stirrup leather end to have a roller.

These hands to be attached $3\frac{1}{2}$ inches in rear of fore-arch.

Girth attachments. There are at present five separate attachments used :—

(1) The straight attachment rivetted to the side bar.

(2) Attachment on runners going round side bar.

(3) The staple attachment.

(4) and (5) The "V" attachment with and without fore-buckle.

The first, the straight attachment, is recommended as the best and strongest, and the committee is supported in this recommendation by the experts of the Government Harness and also of the Equipment Factory.

Shoe case to be attached by one strap only and to be fastened on near side at the angle where it joins the side bar, the rear-arch to be covered with a piece of strong leather to prevent fraying of strap, length of strap including buckle to be 22 inches.

This is a Government issue and will be attached by the strap to the off side of rear-arch, which will have a similar leather covering.

Crupper D.

This the committee does not think necessary.

This completes the tree, its weight not to exceed $7\frac{1}{2}$ to $7\frac{3}{4}$ lbs.

To be attached by two leather-straps coming under the fore-arch and with two buckles attached to the rear of the leather-covered cantle. The buckles to be so placed as to be protected by the fans of the side bars to prevent the possibility of coming in contact with the horse's back. The end of the leather-strap to be furnished with a large brass eyelet, through which a thong may be passed to give purchase when drawing strap tight.

The Seat.

One slot to be cut in seat (one inch long) in rear of fore-arch and free of it for centre cape or baggage-strap.

Flaps to be $16\frac{1}{2}$ inches long and to be screwed to the wooden side bar.

Consists of three tabs fastened with solid head-piece with screw to the side bar. Three tabs are suggested as the rear one could be used when it is necessary to shift the girth, length of tab to be 15 inches.

Straight attachment.

Pannels.

Pannels to be either of felt, stuffed horse-hair or flock.

Felt pannels will have a leather sweating pannel fastened over burr with a slit and small closing strap,

and buckle and a pocket to slide on to the rear fan of side bars, stuffed pannel will have a serge covering and be adjusted to burr and fan as in the felt.

Shoe case to be of the form of the shoe with a strap,
 one inch wide in the centre of the
 arch, one inch and a half from the

circle.

A double inversed pocket suspended by single strap running through all leathers to prevent movement of shoes. A pad to be made to put shoe case in a perpendicular position, to be made of either felt or horse-hair covered with a leather case. The shoe case girth-strap to be 10 inches long including the girth loop. The sword ring of leather to be fastened on outside of pocket and 2 inches wide.

Carbine bucket is Government
 Carbine Bucket. property and needs no comment.

Girth to be a leather-band made in three sizes, a
 solid piece of six inches being left
 in the middle ; from termination
 of this piece outwards, towards buckles, the band will be cut in four laces, the breadth of the girth to be 3 inches, to fasten to girth tabs by two iron buckles at each end and to have five runners for girth tabs and surcingle straps. One extra runner for lancer regiments fitted to off side and clear of the saddle flap, to fasten lance when dismounted.

Nundah, Government, "new pattern," for those regiments who use blankets known
 Nundah. as the Crichton, otherwise the
 nundah will be shaped to the saddle. A good machine-

made numdah is now obtainable at Cawnpore and Dhariwal.

Surcingle.

Surcingle, ordinary pattern, in three sizes, as follows:—

Five feet 2 inches, 5 feet 4 inches, and 5 feet 6 inches, strap with buckle 18 inches to 22 inches.

Wallet. The collapsible wallet, with two straps and double buckles, length $12\frac{1}{2}$ inches, width 6 inches, connected by a yoke;

length of wallet-straps $3\frac{1}{2}$ feet (42 inches).

Picketing-peg case to be sewn on the front and upper part of wallet, to hold peg

Picketing-peg Case, $11\frac{1}{2}$ inches long.

Cape, Cloak and Bag-
gauge-strap.

Cape-strap—1, 24 inches, Rear straps—3, 36 inches, to be made $\frac{7}{8}$ inch wide.

The usual pattern stirrup leathers, $1\frac{1}{4}$ inches wide.

Stirrup Leathers.

The iron buckle to be worn at the stirrup iron end, and not under the saddle end. Stirrup leather slides to be brass.

The irons to be of the Hunting pattern, with two foot bars.

The sides of stirrup widening towards the foot bars.

Lancer regiments to have a ring or D to fasten on lance bucket (if used).

Lance bucket—ordinary bucket; the size cannot be fixed as it must depend on the style of lance butt in use in regiments with short strap to fasten to D on stirrup iron.

The committee thinks that some pattern wallet or holster or means of carrying the shoeing implements should be laid down. Some regiments carry these tools in an enlarged holster, others in a folding case attached to the rear-arch. This committee begs to recommend a wallet fitted with leather runners in which could be placed the file, drawing knife, hammer and cold chisel, and having a small pocket for a few spare nails.

The back of the wallet to be made of sole leather with fittings for above tools and to open with four flaps of ordinary leather; when closed to have the appearance of the ordinary collapsible wallet, with strap and buckle attachment.

There are varied patterns of gram bags for carrying grain, and of all that the committee have had before it for inspection would suggest the following :—

A pair of plain canvas pockets connected with a yoke, capable of holding two seers in each, bound with a leather band round rim of each pocket and to have a cord running through large brass eyelets to close the mouth. This bag is not used as a feeding-bag. The Government order is a goat's-hair feeding-bag, and it is in use in some regiments; it is cheap, clumsy, and difficult to keep clean and sweet; and if not in use daily, soon gets moth-eaten.

APPENDIX B.

HARNESSES.

The ordinary Nolan headstall, the pieces of which are made in the following lengths:—

Headstall. Nose-band, $13'' \times 13\frac{1}{2}''$.

Back stay, $11'' \times 11\frac{1}{2}''$.

Head-strap, $32''$, $34''$ and $36''$.

Cheek-straps, $8''$.

Throat-strap, $3' 6''$, $3' 8''$ and $3' 10''$.

Brow band, $11'' \times 11\frac{1}{2}''$.

Bit head-strap and cheek to be made to correspond with rest of headstall, a small strap and buckle on squares to attach the bridoon to headstall: head-piece to pass through brow-band runner and fasten with a buckle. Plates and bosses, regimental.

Reins. Double reins of following lengths and widths:—

Reins (bit), 2 lengths, $4' 3''$ to $4' 6''$ and $\frac{3}{4}$ of an inch wide.

Reins, bridoon, $4' 3''$ to $4' 6''$ and $\frac{7}{8}$ inch wide. The bridoon rein sewn to the bridoon, the bit rein with buckles.

In three sizes, $4\frac{1}{2}''$, $4\frac{3}{4}''$ and $5''$ for larger horses, the distance from the bar to upper ring on cheek to be $\frac{1}{3}$ the length of the whole size of cheek.

Ordinary snaffle with one ring on each side attached
by small straps and buckle to
Bridoon. square on headstall. Size to be
regulated by the breadth of the bit.

Hunting pattern, attached to saddle by straps and
buckle to the loops on the steel
Breastplate. burrs.

Government having laid down a special way for carry-
ing this rope, the committee does
Head-rope. not like to lay down any fixed
rules, but would suggest that the rope is more get-at-
able when slung from the saddle, or round the neck as
carried by British cavalry and artillery. As carried
now, the rope which should be 10 feet long to be of any
practical use, has to be rolled up so tight that a man
often hesitates before making use of it; but when slung
from the saddle, it is not in the way of the movements
of the horse, and can be quickly utilised.

To be $11\frac{1}{2}$ inches long, and to be a fluted iron hammer
headed peg, with solid point.
Picketing-peg.

The supply of this article is from so many and varied
sources that no fixed rules can be
Blanket. laid down, but the committee re-
commend a marching order blanket not less than 5' 5"
square; weight $5\frac{1}{2}$ lb.

APPENDIX C.

The patterns of belts are so many and varied, that it appears almost impossible to fix on any distinct pattern. The committee, however, are all agreed after careful consideration and inspection of some 40 belts that the best and most serviceable one is the present plain Sam Brown pattern, $2\frac{1}{2}$ inches wide, which should be made with an ordinary draw buckle (two teeth) and plain tongue.

A stud for the carbine captive strap to be adjusted to the belt, so as to fasten in front and to act as a keeper for the tongue of the belt after passing through the buckle.

The carbine captive strap to be attached to the belt by a square sewn on, to be placed on the different sizes so as to come about the centre or small of the back of the wearer. This strap to be made 33 inches long to admit of one turn being taken round the small of the butt and then fastened to the stud on front of waist-belt.

The sword attachment to consist of two single slings 10 inches apart, fastened by two rings or loops rivetted to the waist-belt.

The frog to be a plain, strong frog, with two D's, so that the frog may, if necessary, be detached from the slings.

The committee having inspected the many attachments in use for carrying the carbine, have no hesitation in recommending that in use in the 5th Punjab Cavalry be the one to be universally adopted. It combines lightness, comfort and utility, and is easily detachable.

It is an ordinary cross-belt made of soft pliable leather, and can be removed from the shoulder without taking it off the carbine. It is made as follows:— Shaped cross-belt, 2 inches broad over chest, widening over centre of back to receive carbine, fastened by a square buckle with rounded shoulders. A nozzle, 4 inches long, is sewn on the centre of the belt to receive the carbine, and a small keeper with stud to hold the small of the butt is fastened at a distance of 12 inches from lower side of nozzle.

A similar cross-belt is used for carrying the pistol, but made in lighter leather but of same breadth and buckle. This is recommended for officers, native officers, and all rank carrying the pistol. The belt can be attached to the waist-belt by two runners which have two D's, to which is attached a revolver case without flap.

The present cartridge pouch worn by most regiments is considered too large. The committee recommend two pouches to contain 10 rounds each, to be worn one on each side, and to be fastened to the belt, by a tab coming round back of pouch; two studs to be on the pouch, one to fasten it by tab to the belt, the second to close the pouch.

Note by Major MUIR, 17th Bengal Cavalry.

While endorsing the able summary and report on the proceedings of the committee assembled to report on the best patterns of saddlery and equipment for Native Cavalry, drawn up by Lieutenant-Colonel Burton, I think it necessary to say that if the standard patterns are to be manufactured by Messrs. Cooper, Allen & Co., an arrangement should be made with them to supply, at short notice, standard samples of the whole or any part of the patterns, not only to regiments but to any firm or contractor that may apply for them.

There is a strong feeling in the Bengal Cavalry that the assembling of this committee will give an undue advantage to the firm of Messrs. Allen & Co. The fact that they are the makers and holders of the standard pattern will certainly bring them a very large share of the orders—more perhaps than they could undertake. To give other firms and contractors as fair a chance as possible, they should be afforded every opportunity for inspecting or obtaining standard samples. There are firms, such as the North-West Tannery Company at Cawnpore, which turn out excellent leather work, saddlery and harness, with the best material, and the more of such firms there are the better and cheaper Native Cavalry will be served.

Since the adjournment of the committee, I have had an opportunity of discussing the subject with the Commanding Officers of four Bengal Cavalry regiments, all of whom express themselves even more strongly on this point than I have done.

I have not seen the report by Lieutenant-Colonel Burton on the saddle with the steel side bar saddle. steel side bars invented by himself and Mr. Ledgerd, and brought to its present improved state by the firm of Messrs. Cooper, Allen and Company.

The specimen put before the committee as having been some months in use, did not show from its leather work, girth tabs, etc., the signs of such continued work and rough usage as would entitle it to be considered among tried saddles as a pattern for a standard saddle.

At the same time the many points of advantage which the steel side boards appear to possess, some of which are enumerated below, would seem to mark the saddle as one very suitable for Native Cavalry:—

(1) Cheapness, scarcely dearer than the present pattern.

(2) Imperishability of material, freedom from flaws and from unseen weakness of the steel side bars as compared to wooden ones.

(3) Convenience for packing and carriage of spare side bars.

(4) Thinness, bringing the seat closer to horse's back.

(5) Pliability, to conform to shape of horse's back.

(6) Increased lightness.

(7) No carpenter's or joiner's work required anywhere in the saddle.

I have ordered a couple of these saddles and mean to give them a thorough trial in my regiment.

Note by Major Wood, 10th Bengal Lancers.

I concur with Major Muir's note, and am of opinion that the standard pattern of saddlery and equipment for the Native Cavalry should be in the open market, and that Commanding Officers should have a free hand in the making up of all saddlery and equipment.

In the event of war, or any sudden demand for articles of saddlery and equipment to replace those in use, it would be absolutely impossible for any one firm to comply expeditiously and satisfactorily with indents from many regiments, *however great* its resources might be.

I, too, have not seen Lieutenant-Colonel Burton's report on the saddle with steel side bars. Here again the grave danger of a monopoly arises. The steel side bars might be patented, and the firm of Messrs. Cooper, Allen & Co. might claim the sole right of manufacture.

This saddle has not been sufficiently tried under service conditions and, for these reasons, I would be cautious in recommending its adoption.

I have also ordered two saddles of this description, but with stuffed pannels, and will give them a trial.

Note by Major H. M. MASON, 4th Lancers, Hyderabad Contingent.

I fully endorse the opinions expressed by Majors Muir and Wood, as regards the necessity of the market being open to Commandants of Silladar Cavalry Regiments, and that samples of saddles, equipments, and accoutrements, as recommended by the committee, should be obtainable by any firm requiring them.

It appears to me that Messrs. Cooper, Allen & Co., as stated on page 2 of the proceedings, are quite prepared to issue samples when asked for them; for instance, I have already received four complete sets of saddlery (two of the saddles having steel side bars and two wooden side bars), equipment, and accoutrements, without any stipulations whatever from the above firm. I am in a position, therefore, at this moment, should I wish to do so, to send these samples to any firm that I might select.

With reference to the steel side bars, I have not seen Colonel Burton's report. I agree with Major Muir's remarks on the advantages that they appear to possess, and am giving these saddles, which I have received, a thorough trial, and shall be glad hereafter to furnish a report on them if required.

Note by Captain H. PALMER, 5th Punjab Cavalry.

I don't quite see the point of Major Muir's and Major Wood's notes. I can detect no sign of Messrs. Cooper, Allen & Co. arrogating to themselves only the right of making up the equipment.

It appears to me that they offer every reasonable facility to other firms or any regiment to get the patterns from them.

Regarding Major Wood's note about the tree with steel side boards, I think Mr. Ledgard is most public-spirited in not patenting his invention, and keeping it in his own hands, if its performances are as good as it promises to be.

Regarding the event of war (Major Wood's notes), I understood, when I visited Messrs. Cooper, Allen's Factory, their representative to say, that if they could get sufficient custom and a good number of regiments to promise to come to them, then they could keep ready stocked, for any emergency, sufficient ready-made articles of equipment, in the same way as they do now for Government in the matter of boots.

I cannot follow the fears of Majors Muir and Wood. If Messrs. Cooper and Allen give better leather and workmanship, with moderate prices than other firms, they will receive the larger number of orders, not otherwise.

Note by Captain PHAYRE, 3rd Bombay Cavalry.

The sentence on page 2 of these proceedings commencing "It should be quite understood" down to "open market," seems to me to settle the monopoly question; but it might be added that Messrs. Cooper, Allen & Co. are willing to supply any firm with a pattern saddle (with or without steel side bar).

I think we can safely recommend the trial of the steel side bar, as it is now a non-patented article.

Note by H. IEDGARD.

I endorse the summary and report of the proceedings of the committee assembled, and would add that, as far as my experience goes, I should say there is no doubt that they will result in a great improvement to the equipment of the Silladar Cavalry at large.

I quite concur in the view expressed by the members of the committee that a decision regarding the adoption of the steel bar pattern saddle is, in view of no extended trial having yet been given at present, rather premature.

As a member of Messrs. Cooper, Allen & Co., I must be allowed to express my regret that any discussion regarding my firm should have been imported into the proceedings of the committee. It is true, that the original suggestion of convening the committee came from my firm; but its first letter to the Deputy Adjutant-General dated 24th March 1894 (copy attached), will show what prompted it. Had my firm suspected that there was the least chance of its motives being misinterpreted, it would have certainly stipulated that the committee should meet on strictly neutral territory, the Government Harness and Saddlery Factory for instance; there is no doubt, on the other hand though, that the set of saddlery and equipment, as at present in use by every regiment of Native Cavalry in India, and collected by my firm for the information of the committee, was of considerable assistance to the members.

Dated Cawnpore, 26th March 1894.

From—Messrs. COOPER, ALLEN & Co., Agents, Government Boot and Army Equipment Factory,

To—The Deputy Adjutant-General, Army Head-Quarters, Simla.

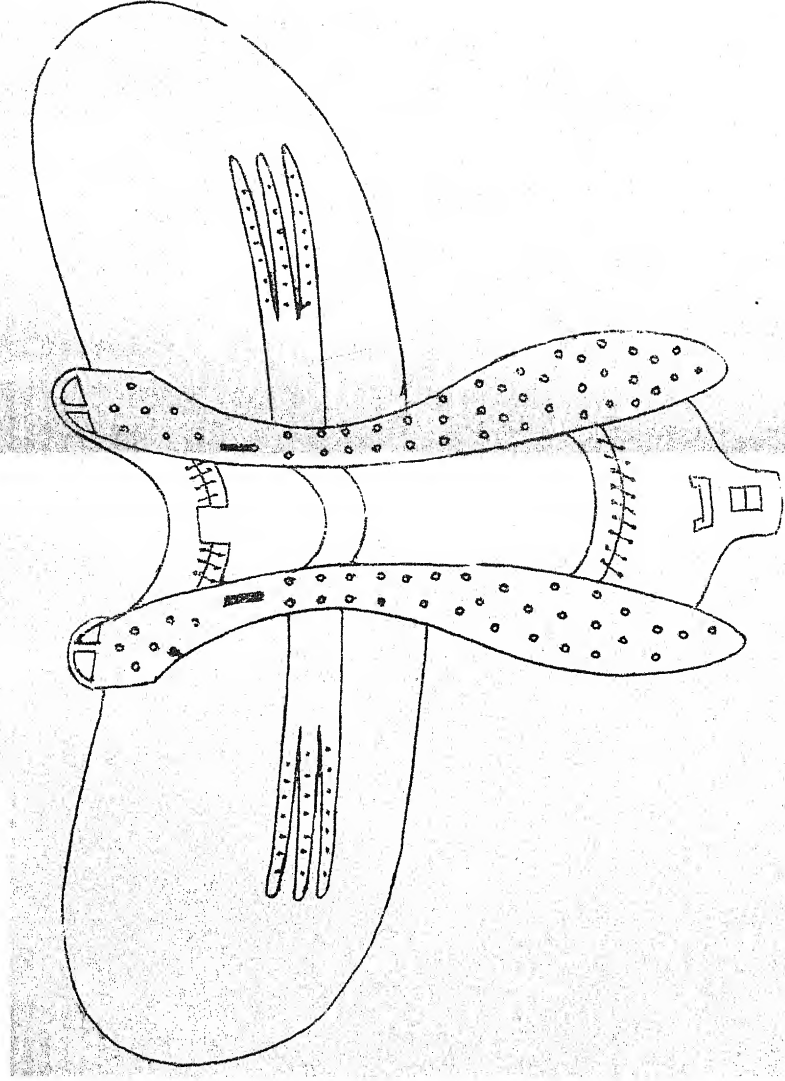
During the last three or four years our factory has been turning its attention to the saddlery and equipment of Native Cavalry regiments. We believe that by virtue of improved experience we are gradually overcoming the difficulties that are inseparable from the starting of a new business. But there is one difficulty that all the experience in the world will not get over, and that is the diversity of patterns of equipment used in the different regiments. So long as this continues, it is impossible to deal with the business in what we consider a satisfactory manner. In the case of army boots there are standard patterns, and by maintaining stocks of these we can comply with urgent indents immediately on receipt. But it would not be safe to keep a single saddle or other item of equipment for Native cavalry in stock. Consequently we are unable to execute indents with any great promptitude, and in the event of war or sudden emergency, all the advantages derivable from the resources of our factory would, in the case of Native cavalry, be lost to the State. We have by us now specimen sets of the saddlery and equipment of every Native Cavalry Regiment in India, and in no single instance* is the pattern of one regiment altogether identical with that of another. We quite recognize

* Excepting the three Regiments of Madras Cavalry, who are equipped by Government through the Ordnance Department.

that it is unreasonable to expect Silladar regiments, who pay for all their equipment, to be bound to take a pattern that might not meet with the approval of their officers. But, as a matter of fact, the divergence in the opinions of the majority of Native Cavalry officers as to the best pattern to be adopted is not so great as to render some sort of general agreement on the subject an impossibility. And we have a proposal to make, which we think should help matters in the right direction, without being open to the objection of having the effect of fettering the direction of the commanding officers in the matter of the equipment of their regiments. Our proposal is that a committee of three officers of Native Cavalry to be elected by all the Native Cavalry regiments in the service, should meet at Cawnpore some time next cold weather and inspect all the specimen sets of saddlery we have collected. Then that a standard set of equipment and saddlery should be decided on in conjunction with our experts [and, if desired, the experts of the Government (Ordnance) Harness and Saddlery Factory] which would embrace the chief features of the present patterns. Such a standard set once decided on, we would undertake (1) to keep up stocks of it, and (2) to supply it at rates considerably cheaper than those which we charge for sets of special regimental patterns.

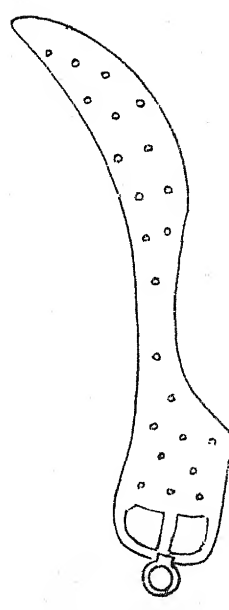
We may mention that we have discussed this proposal with several Native Cavalry officers, all of whom have warmly approved of it. We also enclose a copy of a letter received from the Inspector-General of Cavalry about the same subject. In the event of the Adjutant-General agreeing to our proposal, we are

2nd Bengal Lancer's Saddle



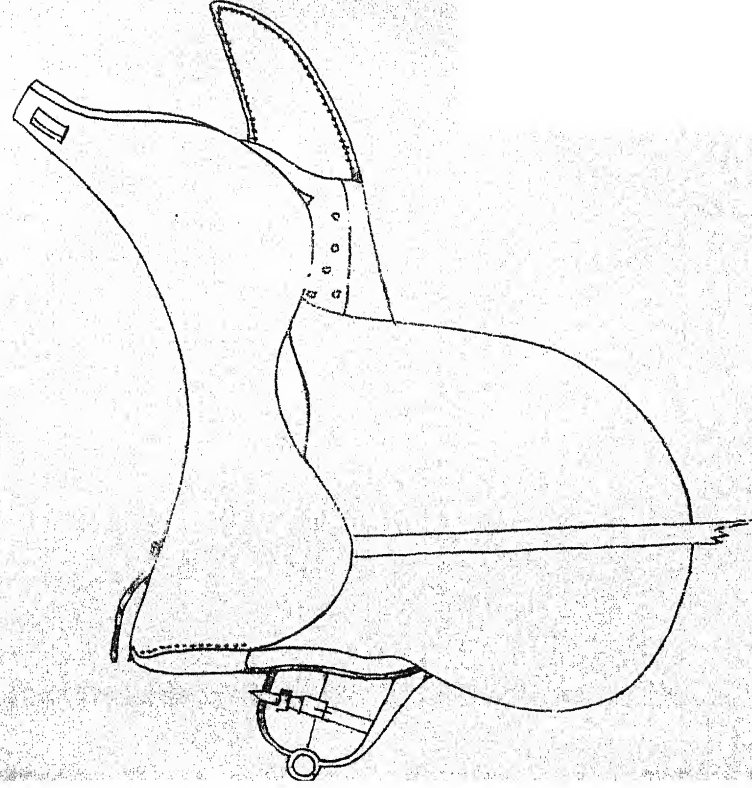
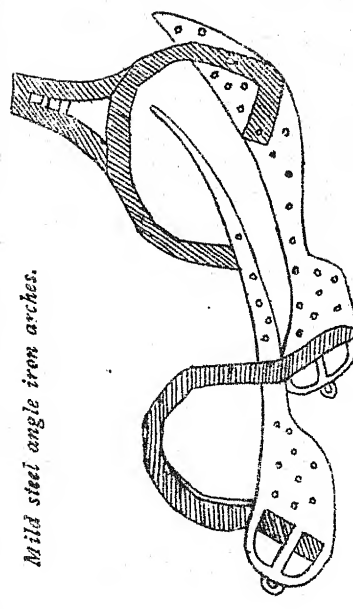
Inner View shewing side bars attached

Perforated Steel Side Bar



Tree shewing side bars with burrs prolongation of steel bar.

Mild steel angle iron arches.



Side View of saddle

advised to suggest—(1) that the voting for the committee to represent the regiments should take place as soon after the 15th October next as possible, *i.e.*, when the leave season is over; and (2) that the committee should assemble at Cawnpore not later than February next.

Dated Harnai, 11th March 1894.

From—Major-General H. F. GRANT, Inspector-General of Cavalry in India,

To—Messrs. COOPER, ALLEN & Co.

With reference to my conversation with Mr. Allen of your firm, I believe that the introduction of a universal pattern saddle, etc., for Native Cavalry, would tend greatly to increased economy and efficiency, and that any steps in that direction would be for the good of the service.

Report by Colonel BURTON on saddle in use in 2nd Bengal Lancers, with steel perforated side bars.

Some years ago it struck me that steel side bars might be used with advantage in making up cavalry saddles, and when in England, in 1890, I was more deeply impressed with the idea, after a visit paid to the Steel Plate Axle-Box Company, near Tilbury; for, on taking up the plate of steel, into which the axle-box

was cut, I was surprised at its lightness and flexibility, and there is no doubt as to its durability, which has now been severely tested in all railways over England and on the Continent, which have adopted the steel axle-plate box for their carriages.

On my return to India, I determined to try what could be done with a steel side bar, and after many attempts, in February 1893, I paid a visit to Messrs. Cooper, Allen's Factory, and with Mr. Ledgard's help had a tree made, and which I now think has many advantages over the wooden bar; and even the Austrian hinged movable side bar.

I have now had some of these saddles in use for a longer or shorter period. One has been tested for the last twenty months, under all conditions of service, with a full marching order kit, over long distances on several occasions, and was ridden on by a non-commissioned officer in a 96-mile reconnaissance in February 1894; and it has proved its stability, its adaptability to the movements of the horse, and the absolute comfort it gave to its rider. This reconnaissance was accomplished in six days, the last 29 miles being done in $4\frac{1}{2}$ hours, with two halts of half-an-hour each.

This saddle is now before the committee, and I trust that each officer will test it in every possible way, and ride on it.

The side bar is made of the finest saw-steel which is necessarily flexible. It is perforated as with a "gunwale cutter" to ensure its lightness. The centre piece of

the bar is lipped or threaded, to prevent its cutting the leather and to give resistance, and consequent play over the withers and quarters of the horse.

This tree has been weighed and compared with all the wooden trees in Messrs. Cooper, Allen's Factory (of the several regiments), and it is lighter than any of them, with the exception of one which is of same weight; this tree weighing $7\frac{1}{2}$ lbs. against the ordinary wooden trees which weigh from $7\frac{3}{4}$ to 9 lbs. 6 oz. each.

I have had, besides the saddle now before the committee, eight others in use; they have been ridden on, tested in route marching, cross-country riding, and in riding-school daily. The riders speak in the highest terms of them, and state that above everything they feel themselves so much closer to their horses; that they can shift themselves and so give themselves ease on a long march; and at the same time feel they are not throwing the weight on a particular part of the horse.

The saddle speaks for itself, and I should be glad if any officer would order one and give it a fair trial. I claim nothing for the saddle; but the substitution of a flexible steel bar for the present wooden bar, and that it gives automatically with the horse, and ensures freedom from sore-back, or galled withers, and gives greater comfort and ease to the rider. It is lighter than the wooden tree—in some cases by $1\frac{1}{2}$ and 2 lbs. The difference in price is so small, Rs. 2, as to make it a matter of no importance; and I have little doubt that if it were adopted, the steel being easily obtainable in large quantities, some means would be devised for cutting the

side bars by machinery (as in the case of the steel axle-boxes), and thus make the saddle cheaper than the ordinary wooden side bars.

In conclusion, I would add that spare steel bars are more easily carried on service. Twenty-six bars, steel, occupying the space of 14 wooden bars. Further, with the present bars, it is necessary to have a carpenter and blacksmith, while with the steel bar the latter only is necessary. I have been asked to patent the bar, but I do not wish to do this, as in the event of its adoption it would add to its price: and I shall be sufficiently repaid if I have hit upon the right thing which will solve our many troubles on service.

No. 614-N. S., dated Cawnpore, the 28th September 1898.

From—Messrs. COOPER ALLEN & Co., Government Boot and Army Equipment Factory, Cawnpore,

To—Major F. W. P. ANGELO, 9th Bengal Lancers, 37, The Mall, Umballa.

DEAR SIR,

I am in receipt of your letter of the 13th, and shall be delighted to give you all the information you require for your book, extracts from which you have been good enough to show me already, as I feel sure it will be of the greatest assistance to cavalry and other officers in India.

2. Since the committee was held here to recommend universal pattern saddlery for the Native Cavalry we have, acting on advice and hints from many regiments who have tried these saddles, made many small

improvements which together will certainly contribute to render a saddle more nearly perfect. These I will endeavour to enumerate :—

IMPROVEMENTS MADE.

REASONS.

1. Length of seat has been changed from 18" to 16½".

1. 18" seat has been found too long for C.-B. horses.

2. The lace attachment to seat is now entirely discarded and the seat is attached with a strap which buckles behind rear arch.

2. With the lace attachment the seat was liable to sink or sag.

3. The seats are fitted about ½" higher.

3. As do what we will, the leather slightly stretches after being ridden on some months, and this allows for the seat coming down to a comfortable position and yet clear of the horse's back.

4. Side bars ¼" wider at front and rear bearings, consequently bottom measurements are ½" wider.

4. The extra ¼" was found necessary for strength, as breakages invariably occurred at these points. The perforations are now fewer and differently arranged so as to give the maximum strength. The weight of the saddle is thereby increased only by 2oz.

5. The front burrs instead of being a continuation of the side bars are now separate pieces of steel with double D's to attach wallets and breast-plates.

5. To clear the horse's withers better, as they can now be raised higher.

IMPROVEMENTS MADE.

REASONS.

6. Rear fans of the side
leaves are bent up $\frac{1}{2}$ " more.

6. We had several complaints from regiments that the rear fans rubbed the horses, and we found that the removal of stuffing was not sufficient to remedy this evil, hence the necessity for bending the rear fans $\frac{1}{2}$ " upwards.

7. Pannels are "quilted"
in front of front arch and rear
of rear arch.

7 These we now usually supply lined with thin leather instead of serge, and at the portion under the front burr and rear fan we put little or no stuffing. This keeps these parts of the saddle clear of the withers and quarters of the horse while the stuffing remains only on that part between the front and rear arch, which is the proper bearing surface of the saddle. Stuffed pannels are usually preferred by Native cavalry to numdah pannels.

8. No slots in rear arch.

8. We do not now, unless specially required, make slots in these for the marching order straps as these slots were found to weaken the arch. Straps now pass right round the arch.

9. Cantle $\frac{1}{2}$ " more upright.

9. To enable marching order kit to rest better behind saddle.

IMPROVEMENTS MADE.

REASONS.

10. The straight attachment rivetted to the side bar is preferred to the staple attachment.

10. The straight attachment is less liable to break; still regiments are now preferring something in the form of a handle, so we have designed one that works similar to the stirrup attachment and lies flat against the horse (whether the horse be in or out of condition) and does not project outwards and wear away the flaps as the rigid handle girth attachment did.

11. A fifth and smaller size of saddle-tree is now kept in stock.

11. Owing to a large number of high-withered horses in the Native Cavalry.

3. I send you herewith four diagrams (A, B, C and D) of the new saddle-tree showing respectively:—

- (a) Inner view with side bars attached.
- (b) Tree with steel burrs.
- (c) Dimensions of the ordinary sizes of saddles made.
- (d) Method of measuring the above (XI size).

And a fifth diagram (E) showing the dimensions of the up-to-date saddles most carefully fitted and supplied recently to the 1st Bombay Lancers, 8th Bengal Cavalry, 13th Bengal Lancers, and according to your directions to the Patiala Imperial Service Lancers.

Owing to the Patiala Lancers having smaller horses and a number of thick-set ones, 374 out of the 510 saddles supplied to them were made $\frac{1}{2}$ " lower in the front arch. Besides the difference in height of front arches it was found necessary, as you are aware, in some instances to put a No. A front arch to a No. X or even XI saddle and *vice versa*. The only other alterations you wished us to make in the Patiala Lancers' saddlery were as follows:—

- (a) Flaps not to be cut so far forward.
- (b) No rivets in the seats.
- (c) Numdahs should be cut so as to fit the saddle and leave square portions behind the flaps to prevent friction from shoe case and carbine bucket.

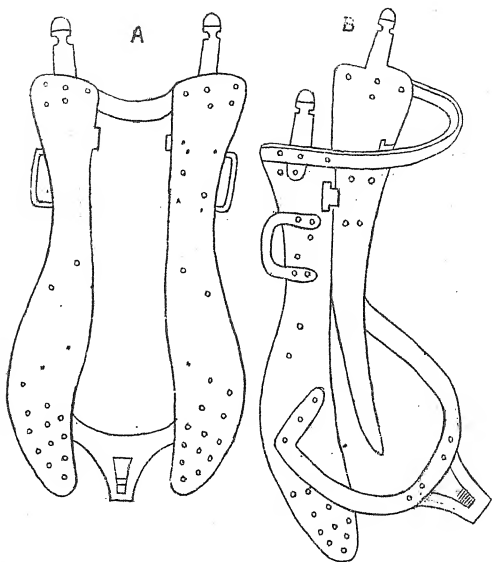
4. The alterations in the saddle we now recommend (diagram F) appear small, but together represent a distinct improvement on the Committee pattern, making it both more comfortable and likely to last longer.

5. I append a statement (G) giving the approximate weight and cost in detail of a complete set of saddlery as requested.

Yours faithfully,

H. LEDGARD, AGENT,

Govt. Boot & Army Equipment Factory.

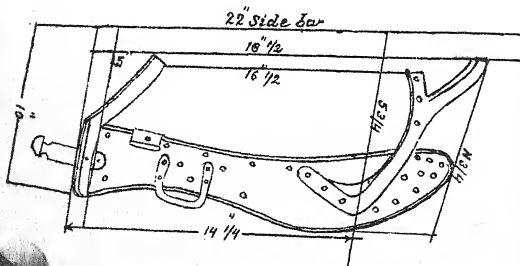


C.

Measurements of various sized Trees of Saddles.

Sizes.	Upper width of front arch between side bars.	Lower width of front arch between side bars.	Upper width of rear arch between side bars.	Lower width of rear arch between side bars.	REMARKS.
	Inch.	Inch.	Inch.	Inch.	
A	5	10 $\frac{3}{4}$	6	12 $\frac{1}{4}$	Measurements should be taken from edge to edge of side bars.
B	5 $\frac{3}{4}$	11 $\frac{1}{4}$	6 $\frac{1}{4}$	12 $\frac{1}{2}$	
C	5 $\frac{3}{4}$	11 $\frac{3}{4}$	6 $\frac{1}{2}$	13	
X	5 $\frac{1}{2}$	10 $\frac{1}{2}$	5 $\frac{3}{4}$	11 $\frac{3}{4}$	
XI	5	10	5 $\frac{3}{4}$	11 $\frac{3}{4}$	

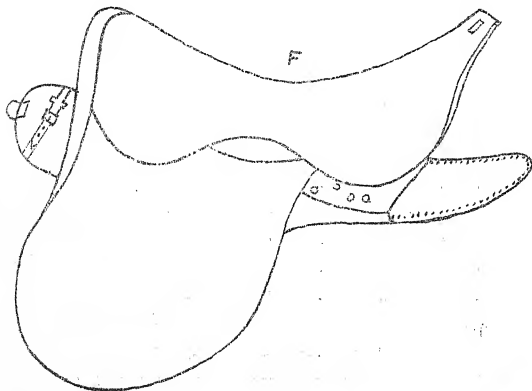
D.



E.

*Dimensions of improved Saddles recently supplied to
Regiments.*

	A	B	C	X	XI	TOTAL.
8th Bengal Cavalry ...	120	60	40	170	80	470
13th Bengal Lancers ...	150	60	5	346	10	571
1st Bombay Lancers ...	95	...	...	339	36	470
Patiala Lancers ...	83	5	...	271	151	510



G.

Statement showing the weight and cost in detail of
a complete set of Standard Pattern Saddlery.

				Weight.	Cost.	REMARKS.
				lbs.	Rs. a. p.	
Saddle-tree	...	...	8	7	8 0	
Saddle	...	...	19	25	0 0	
Numdah	...	...	2 $\frac{1}{2}$	7	0 0	
Wallets with straps	...	...	3 $\frac{1}{2}$	5	8 0	Saddle complete. Weight. Cost. lbs. Rs. a. p. 29 $\frac{3}{4}$ 47 6 0
Marching order straps	...	...	$\frac{1}{4}$	1	6 0	
Stirrup leathers with irons	...	...	2 $\frac{1}{2}$	4	8 0	
Surcingle	...	...	1	2	0 0	
Girth	...	...	1	2	0 0	
Headstall with reins, bit and bridoon.	...	...	5	9	0 0	
Head-rope	...	...	$\frac{3}{4}$	1	8 0	
Breastplate	...	...	1	2	4 0	
Shoe case with pad	...	...	1	1	14 0	
Carbine bucket	...	...	2 $\frac{1}{2}$	4	8 0	
Lance bucket	...	...	1	1	12 0	
Total	...	...	49	75	12 0	

MILITARY SADDLES.

THE following most interesting and instructive lecture on the above subject was delivered by Colonel the Hon'ble H. G. L. Crichton, Commanding Hampshire Yeomanry, on the 8th July 1892, at the Royal United Service Institution, with Major-General J. Keith-Fraser, C.M.G., Inspector-General of Cavalry in Great Britain and Ireland, in the chair.

The subject about which I have been asked to lecture is a wide one, and includes a variety of different descriptions of saddles.

There is an old saying about putting the saddle on the right horse, but the greater difficulty always has been rather to put the right saddle on the horse, and this difficulty has existed in a great degree ever since the experiment was first tried; but I feel fully convinced that a better saddle might be placed upon the English cavalry horse than he has been made to carry of late years; and I believe that the public lectures which have been given in military societies, such as the one in Dublin by Veterinary Lieutenant-Colonel Thompson and at Aldershot by Veterinary-Captain Smith, will be of the greatest benefit by drawing the attention of regimental officers to what is below the surface of the horse, and so showing where the pressure may and where it may not be placed.

A horse is the most patient of sufferers, and to a certain extent a cavalry officer is at a disadvantage in comparison with an infantry officer when trying equipment experiments, as the poor animal cannot

express its approval or the reverse of the trial; but there is one thing certain that the horse's back will tell no lies, and if the equipment is not a good one, the back will precious soon show it.

In a most excellent book called "Mannual of Saddles and Sore Backs," Veterinary-Captain Smith gives a picture of a horse with a regular tale of horrors in the way of sores on his back, and the poor brute's eye is admirably depicted to show the pain he is suffering; as this book is very widely read, I feel I ought in justice to the British Cavalry officer to say that the causes for the greater number of these sores no longer exist, as they were inherent to a particular saddle, which is also depicted in his plates, but the manufacture of which has long since ceased; and if there are any of these saddles still retained in the service they should speedily be destroyed, or they will prove disastrous to those who may be doomed to use them on service.

There has been held in London quite recently an exhibition of saddlery at the Saddlers' Hall, where amongst many other articles of saddlery were collected the latest military saddles from eleven European armies; by the courtesy of the Saddlers' Company I was enabled to thoroughly examine them, and also to make drawings of them, which I have enlarged and now produce. To try and make my lecture interesting and possibly instructive, I feel I cannot do better than make a comparison of these different equipments, and to try to draw inferences therefrom. Military saddlery is a subject to which I have given a deal of attention for many years; and, therefore, I hope I may be excused if I am found criticising occasionally, and frequently.

giving my opinion; it will be done with the best possible intentions for the good of the Cavalry service of all nations.

No nation need certainly be jealous of any one having copied from the other, as I never saw eleven machines all intended for the same purpose so dissimilar one from the other.

The Italian.

The arches of this saddle are made of wood, and appear very strong; they slope outwards.

The seat is a loose pilch, padded in strips; it rests on a strong piece of leather, which is attached to the two arches.

The side boards are short, like a pack-saddle.

There are thickly stuffed pannels, lined with flannel; they are about 1 foot 9 inches long by 1 foot deep.

A large thick white blanket is placed under the pannels.

The buckles are galvanized.

The girth is a very broad one, and made of twenty-one thick pieces of cord with three girth-tabs.

The kit is carried in two sheep-skin bags, which are hung on each side of the saddle behind; two pockets in each sheep-skin.

The saddle has rather a weird appearance, and has what we should call a great fault in that everything is

covered up, and you cannot see anything that may be put on wrong underneath and so be doing damage to the horse's back; the whole is exceedingly cumbersome and weighty, and I should have thought the men would sit very high above their horses, and so have little control over them with the leg, as well as making the whole top-heavy and inclined to roll.

The American.

The American saddle is like most other things of this nation's, most original and clever.

The tree is, I presume, a mixture of wood and iron, built up like a plain hunting saddle, but as it is covered over with black leather, I could not tell its construction.

The side boards are short and have a very wide bearing, and are very close together along the backbone.

A large, thin grey blanket is used under the side boards, but I could not see how it is prevented from slipping if it has a mind to do so.

The girth has the widest bearing on the saddle of any shown; the straps go right over in front and behind the arches, the lower part of girth is very short, and is made of strong dark horse-hair twisted up into twenty-four cords between two heavy rings which are fastened with leather thongs to the rings which join the girth-tabs together.

The carbine bucket is a very short one, with a hole in the bottom of it, and without seeing how it is carried, it is difficult to understand how the carbine escapes injury.

The stirrup is most peculiar; it is made of wood with a blank leather guard in front of it; it is very light, and I am told the use of it is to protect the foot in riding in long grasses.

There is no seat nor are there any flaps in this saddle: it is very light and workmanlike; but I cannot express an opinion as to the comfort or otherwise of riding in it in hot or wet weather.

The Dutch.

This is a saddle of a very novel and ingenious description. The front arch appears to be flat iron or steel set on edge and sloping back, the rear arch is also of flat iron.

The cantle is long and flat, instead of standing up like most cantles: thus the cloak or kit is strapped on top of it instead of behind it, which insures its being kept off the horse's back, but has the great disadvantage of causing top weight. I should also think that if subjected to rough treatment the cantle would be very liable to be broken off.

The peculiar feature of this saddle is the way in which the side boards are made adjustable to the shape of the horse's back, being on a hinge with the two arches; the hind arch is continued all the way under the seat to the front arch and the stirrup leather goes round it.

The seat of the saddle looks very comfortable ; it is cut in strips and sewn up again, with a second layer of leather underneath treated in a similar way, so as to arrive at the proper shape and make it strong ; we might well imitate this seat.

The flap is of a peculiar shape, the lower part of it very far to the front.

The girth comes direct from the front arch and has to be kept back by a strap from behind the flap on the side board. I cannot think this a good plan, as I should say it would make wrinkles on the girth in a dangerous place, and the lead of the straps does not look right ; the girth is of brown canvas.

There is a small bucket which looks as if it was intended to carry the carbine in front of the saddle on the off side.

The wallets are capacious.

Altogether this saddle shows that the Dutch Cavalry have been very much alive to the changes of modern times in cavalry equipment, and have profited thereby. There was nothing to show what was worn between the saddle and the horse. I should like very much to provide them with the numdah and blanket of the equipment I advocate, and another girth attachment.

The Austrian.

The front and hind arches are made of 3 inches broad hollowed-out iron, with a long cantle.

The side boards are roughly made, are short, but appear very strong and of a good shape.

The seat is padded and stuffed, passed over the cantle, and fastened to the front arch; it rests on a strong piece of leather, which is attached to the arches and the side board by thongs. The flaps are one with seat and appear very broad (18 inches); they are padded in front.

The wallets are very capacious; there are two pockets in them for ammunition, and an attachment which looks as if it was intended for carrying a peg.

The shoe-case is half under the flap.

A small hunting breastplate.

The blanket is an excellent one; made of white flannel; it is large and thick, and consequently heavy.

There are two girth-straps well back on the side board, and a hard black leather girth.

The peculiarities of this saddle seemed to be the enormous amount of leather in the flap with a stuffed pad in front of it, and the beauty of the thick white blanket; but I could not see how the blanket is prevented from working back. The stirrup-irons appeared to be very heavy; we might with advantage copy the material of the blanket and take a lesson from the side boards.

French.

The arches are made of broad flat iron, hollowed, with a thick rim.

The side boards are wood, and long and broad.

Pannels are attached to the side boards; they are lined with strong canvas.

The seat appears a comfortable and capacious one, of thick leather, supported by canvas, and fastened with copper rivets to the side boards.

The wallets are large.

The shoe-case is carried on the off side, and is of a peculiarly good shape.

The girth looks an excellent one, composed of six pieces of webbing joined with leather pieces.

The buckles are some of them brass and some galvanized.

There is no numdah or blanket shown, but the French, I know, use a dark-blue blanket.

The pannels and the tree of this saddle appear very heavy, the seat and flaps are of a good shape, and the shape of the shoe-case is well worthy of imitation.

Danish Cavalry.

This saddle has only one arch, which is in front, and is a small piece of flat iron; it has no side boards.

The pannels are broad and thick, and lined with canvas.

The seat and flaps are all in one and appeared to be the foundation upon which the whole fabric was built;

the seat was joined down the centre, and made of a very thick leather, with a strong ridge behind to keep the man in the saddle.

The wallets are of a medium size.

The saddle bags are of canvas with a leather covering, hung by two straps, one over the seat and one over the hind part of the saddle.

The girth is made of thick webbing with two girth-tabs, in which there are eyes, only the strap and buckle being on the girth.

The buckles are black.

There is no blanket, but a very large felt numdah.

This I thought a most peculiar saddle; being without a tree, it certainly adjusts itself to the shape of the horse's back, which is right in theory, but I should have thought it would have been pulled out of shape by the powerful method of girthing up the horse, and the girths, surcingle, and stirrups are all fastened to the flap. The narrow strap for saddle bags across the seat and the ridge behind cannot be conducive to the comfort of the rider.

Danish Artillery.

The arches of this saddle are of wood, with steel plates let in front and rear, and are consequently very strong.

The side boards are rather flat, very much turned up in front.

There are no pannels, but a good red blanket.

The girth is a thick leather one, with one large buckle.

The wallets are of a peculiar shape, square at the bottom, with a large cover.

The buckles are all galvanized.

The seat is a sort of pilch, which rests on leather stretched between the arches; the seats and flaps are in one.

There is a very small bucket, which looks as if it was intended for carbine, on the off side, near the wallet.

This saddle appears of a more recent date than the cavalry saddle of the same nation; the tree appears of excellent construction and well worthy of note; the blanket and wallets are good, the girth is peculiar, the seats and flaps cannot be properly judged unless ridden in; they are evidently very light.

Belgian.

The arches are flat, broad iron, rather weak I should have thought.

The side boards are short, and they have under them thick white numdah pannels.

There is no blanket shown with the kit, but I expect there must be one used. I should be sorry to trust the numdah pannels without one.

The girth is composed of sixteen cords run through strips of raw hide.

The wallets do not look very large; they are covered with a cloth covering, which has the number of the regiment and a crown upon it.

The buckles are some brass and some steel.

The seat looks a very good one, and the flaps of a moderate size.

The saddle bags are capacious, but I should have thought they would have interfered with the movements of the horse from being so far behind.

The cloak is fastened on top of the cantle, which lies flat; this is an excellent plan for keeping everything off the horse's spine, but increases top weight.

This is a very neat looking equipment (bags excepted), the girth appeared an excellent one, and there is a rolled head or heel-rope.

German.

The arches are made of broad iron, hollowed, with a long cantle, and are attached to wooden side boards.

There are no pannels, but a good big blanket with eight thicknesses. I could see no way for keeping the blanket in its place.

The girth is of leather with three long tabs.

The wallets are narrow, but broad on top.

There is a shoe-case with a rope coiled round it.

The seat is a pilch one.

A corn sack is carried behind the saddle, with corn at each end; the cloak is strapped under the cantle. The whole is covered over with a shabraque, which hides everything from view, and must be hot.

The stirrups have two lance buckets a-piece ; it is a cumbersome and heavy equipment, and nothing very worthy of note in it.

The Greek Artillery.

This saddle has iron arches and wooden side boards, with black numdah pannels.

There was no blanket shown with the saddle, but the pannels looked as if they would require something between them and the horse.

The girth is of black hard leather.

The wallets are capacious.

The buckles are steel and galvanized.

There is a shoe-case on the off side.

The seat and flaps are all in one, and supported by rather a narrow piece of leather stretched between the arches, which give the appearance of a saddle the reverse of comfortable to ride upon ; the flaps have a pad in front.

The tree of this saddle seems to be of a modern construction ; the stirrup-leather passes through the side board, but not in a way to cause an unevenness.

Greek Cavalry.

This saddle is of the old post-boy and artillery driver pattern.

The side boards are wood, with fully stuffed pannels, long in rear, but no projection in front.

The girth is a web one, like our plain saddles.

The wallets are very capacious.

This is the only saddle apparently which has a crupper, which shows how little that instrument of torture to the horse is now considered necessary.

This seat looks as comfortable as the Greek artillery looks the reverse.

Russian.

The arches are of round iron, liable, I should have thought, to open; they slope outwards, the side boards are wood, square behind and short, very much turned up in front, and close together.

There are white numdah pannels on the side boards.

There is no blanket, but two large pieces of white felt, the upper one is covered with Russia leather.

The girth consists of two pieces of raw hide, very wide apart, with another piece of hide about a foot long to keep the two from separating under the horse; these straps go over the side boards under the seat.

The wallets are like two little kit bags, with a cord at the top to close them; they are small.

The seat is blocked to fit over the arches, and looks a very comfortable one.

The flaps have a padded front.

The saddle bags are capacious; they hang not across the seat, but over the numdah behind the cantle.

This equipment is the most remarkable one in the Exhibition, and for excellence of work could not be

excelled; the whole is made of sweet-smelling Russia leather; the straps are rather delicate, and I cannot think it is exactly the saddle which the Cossacks of the Don use. The horse must be very much covered up by the large pieces of felt, which constitute the numdah and blanket surmounted as they are by a large piece of Russia leather, which combined reminds one very much of an apparatus used for hot fomentations; but the girth, the seat, and the two layers of felt are well worthy of note and consideration.

British.

The arches of steel, with points below their side boards. The side boards are long and narrow at the end, with a piece of leather round the rear ends to prevent their being chipped.

There are no pannels, but a thin brown blanket is placed between the side boards and the numdah; the numdah is shaped like the reversible numdah recommended by me, but the straps are so sewn on that it cannot be reversed.

The wallets look small when compared with the wallets in the Exhibition.

The seat has a division down the centre, something after the principle of the American. I believe this is not approved of.

The girth is a leather one.

The carbine bucket is hung on the off side, and attached to the girth by a strong piece of leather.

The side boards are made long and narrow for carrying pannels, and it stands to reason that if these latter are discarded, the side boards want alteration.

Turkish Cavalry.

Turkey has sent, since the Exhibition of Saddlery was closed, most complete sets of cavalry and artillery saddlery.

The arches of cavalry saddles are hollowed-out iron, very broad, a high front arch, and a long cantle.

The side boards are wood, same breadth all along and short; they carry pannels, beautifully stuffed, of the same shape as the side boards.

The stirrup-leather goes through the centre of the side board, in a very bad place. It would be very well for Turkey if they took a hint from the Austrian side board, of the best way for the stirrup-leather to hang; the leather is under the flaps.

Their wallets are large, but lie very flat; they are about half the thickness of our own; in the near one there are two pockets for ammunition; in the off one a place for shoes. The seat is a loose pilch, and great trouble is taken to make it soft; there is a broad piece of leather stretched under the seat.

Their girth is a web one, with three straps.

The shoe-case is a very good one, like the French, and on it is rolled a rope.

There is a little shabraque, which is lined with felt.

The artillery saddle has same description of arches and side boards, but a large blanket, 8 feet by 6 feet, instead of pannels.

The shoe-case is like the British.

The girth is leather, with one large buckle.

The whole kit is very complete; collars seem very well stuffed.

Cow-boy.

The arches of this saddle are made of wood, covered with raw hide side boards ditto, which make it very strong.

The girth is in two pieces: one in front, and the other behind the saddle, and can be joined under the belly; the stirrup is very far back, and goes over the seat. The flap is attached to the stirrup-leather.

There is a sheep-skin bag behind, like the Italian, for carrying kit.

Under the pannel is a leather, lined with felt, on which the saddle rests.

There is a red blanket next to the horse.

The two girths are of strong cords under the horse.

This saddle is very strong, as can be seen any day at the Wild West Show. They say it seldom breaks, and it gets very rough work. The front girth is the main one, and is very far forward; it can be tightened to any extent by the long leather-strap which passes between the two rings. From the girth being so far forward, it is kept tight by the weight of man in the saddle acting as a lever against it. It is very remarkable how these saddles cling to the back. A man can drag himself from under the horse's belly up into the seat without moving

the saddle. They have no points; they say, the blankets do not slip back, and that the saddles never gall the horse.

The flap being attached to the stirrup-leather appears a very sensible plan, as it requires only a small piece of leather, and it is always where it is wanted; whereas with a large flap a great deal of it is never used, and it tends to make the horse hot, besides being heavy and expensive.

Crichton.

The arches are made of steel; there are no points below the side board.

The side boards are broader than the British, and the ends are not so pointed.

There are no pannels, but a blue blanket, about 6 feet square, is carried between the side boards and numdah.

The numdah is so shaped that it can be reversed and used either side to the horse, or either end to the front, and there is a strap at each end to attach it to the front and hind arches of the saddle.

The wallets have tins inside them which keep them in good shape, and enable the cloak to be tightly strapped to them, whether they are full or empty.

The buckles are all brass.

The seat is rather longer than the British, and supported by welting

The stirrup-leathers are passed through a bar on the side board, and not through the side board itself.

The girth is a leather one, cut in strips on each side. The carbine bucket is like the British.

Now I will endeavour to compare all the foregoing saddles, and see how far different nations are agreed, and how far they are at variance, and when I express opinions on their suitability, or otherwise, I do so simply from observation, and therefore am very subject to correction, as I always hold two things about saddlery, that no opinion is worth a rap unless formed after personally trying the equipment by riding in it a great many miles, and seeing it tried on a number of horses for a period of a year or two by different corps. I have had no opportunity of trying any of the saddles, except my own, nor do I know how far any of them have been tried, except the British, and some of them look to be of a very novel construction.

On the question of the material of the arches of the saddle out of 13 shown, I find 5 wood and 7 iron, and one no arch at all to speak of, *viz.*, the Danish.

There are a variety of iron arches, broad, flat, and curved, with a strong rim, like the French, Austrian, Dutch, Belgian, Hungarian, and Greek Artillery are the most common; the round iron, like the Russian, and the angle steel, of which the British are made; of these I should say decidedly that our latest steel arches are the strongest. Iron is always liable to open, if not by use by a sudden blow, or horse rolling upon it. This may be said of a wooden arch, with regard to violence, as the latter, when combined with iron-plates, may be smashed, but will never open; and if smashed up, it cannot help being noticed; whereas iron arches may be

opened by a blow, or gradually opened by pressure, and the horses gradually suffer from a badly-fitting saddle; and if one opens from pressure the probability is all of the same pattern will do so, without any possibility of cure, as when iron is closed by force it will open again all the more easily when pressure is applied.

The wooden arches are favoured by Italian, American, Danish Artillery and Greek Cavalry; of these the Italian and Danish Artillery seem very strong; the American and Greek, being covered up with leather, I could not judge of; the Danish Artillery struck me as being the best one in the Exhibition, with a broad and long piece of steel on edge let into the wood, it would take a tremendous blow to smash it, and it could not open.

Points.

We have always had in our English saddles certain things called "points" which are the continuation of the front arch below the side boards: these, as a rule, bear either too hard or not at all; in the former case they utterly upset the balance of the saddle and hurt the horse; in the latter they are useless. In saddles of my own pattern I have lately done without them with beneficial results, and I do not find a single saddle of the thirteen, except the British, which has points.

Side Boards.

The side boards are almost the most important part of the saddle, as they are the medium for conveying the whole weight of saddle, and whatever is carried upon it, to the horse's back. The following have a short

side board:—Italian, American, Dutch, Austrian, Belgian, Danish, Greek Artillery and Russian; the British, French and Greek have a long one. The disadvantages of side boards being long behind are that the further back pressure is placed on the horse's back the more the friction, owing to the movement of the hind quarters, and the longer the saddle the greater will be its movement at its extremities.

The advantages of having a long side board are, that it enables the kit or cloak when placed behind to be better carried than on the short one, and therefore I consider the best saddle is the one with a long side board, so arranged that the last 3 or 4 inches of it can carry the kit but not touch the back; this can best be done by the blanket being folded of a certain length and carried between the numdah and saddle, and this arrangement I have found to answer admirably. Now I wish to draw special attention to the side boards of the Dutch saddle, which reminds me that the Dutch have considerable experience in side boards of another description, *viz.*, on their boats, which may possibly have specially directed their attention to the subject; these are intended in a very simple way to adjust themselves to the shape of the back, but I hold that their doing so leads to another danger, as it cannot be expected that a horse will lose or gain muscle in the same degree all over the back, and suppose the back alters shape under the seat of the saddle where the greatest weight is, the board would adjust itself accordingly, which action of it might bring the edge of the board in front in contact

with the side of the withers where the horse might have altered shape in a converse way to the back. For this reason I must here mention a saddle which was shown at the Exhibition by the gallant officer, our Inspector-General of Cavalry, who has done me the honour of taking the chair at this lecture, which saddle obviates this objection, as the front part can be adjusted in one direction and the rear in another; this is excellent in theory, but what it would be in practice I cannot say; but I hear of a very successful trial of thirty of them by the 7th Dragoons in Austria. I should be a little afraid of uneven pressure in them on account of the breadth of the hinges. What I think is of the greatest importance in the fit of a side board is the curve in its length more than in its breadth, as horses differ almost more in that way than the other, and the amount of weight at the moment it is placed on their backs will increase the hollow as well as age. I should therefore like to see a side board which would adjust itself to the hollow of the back as well as the other way. I have heard of a steel (board I cannot now call it) bar performing these functions, and I should be very glad to hear more of it. If a side board is too straight it rests on its two ends, and if it is too curved, it rests on a small piece in the centre.

This of course can be met by clever and careful folding of the blanket so as to make up the deficiency, but a good fitting side board is the foundation of successful saddlery, and the best one can do now is to get a side board shaped in a medium way which will be most likely to fit best the greatest number of horses.

Pannels.

Of the saddles in the Exhibition, I find only three have pannels, *viz.*, the French, Danish, and Greek Cavalry.

I know that pannels have some very strong advocates, and they may be very well when there is a saddler close at hand to teaze and arrange the stuffing exactly where wanted; but stuffing is very contrary, and will not always stop where it is wanted, and in a strong regiment, moving, perhaps, every day, pannels get hard and lumpy, and there is not time to teaze and arrange them, no matter how efficient the saddler-sergeant and his assistants may be; it is a long business arranging the stuffing of a saddle, and also when a regiment is much scattered it is impossible to send a saddler with every party.

The plan of chambering a pannel, that is, taking all the stuffing away from one particular spot, where the horse's back is sore, may sometimes answer very well; but it is a dangerous experiment, as no one can depend upon a saddle remaining in exactly the same place on a horse up hill and down hill and on the level, and if the edge of the chamber gets on the sore, the remedy intensifies the malady in a very short space of time; when the hole is made large enough to prevent any possibility of the sore being touched, the extent of the bearing is so much reduced, that another part, where the bearing becomes excessive, will probably suffer. The best and surest remedy, I believe, is to have the horse that is touched in the back led for a day or two without a saddle, and the man mounted

on a sick man's horse, or go as baggage-guard. I am not an advocate, when the skin is really broken, of tinkering with the back, either with a pannel or a blanket, as the least friction then delays the cure; lumps and swellings may be overcome by arrangement of saddlery, but when the blood appears it is time for the veterinary art to step in and give the part rest. I must say I think the majority of foreign nations are right in discarding pannels and adopting.

The Blanket.

Of the 14 saddles under discussion, 3 have pannels, 7 blankets, 2 numdah pannels, 1 side board only, Dutch; 1 double layers of felt, Russian. I should say that the two with numdah pannels, *viz.*, Greek Artillery and Belgian, must use blankets as well, and the Dutch must have something under the side boards, which would probably be a blanket, and if so, the numbers would mount up to 3 pannels, 10 blankets, 1 numdah layer. I will state what I have, from long trial, gathered to be the advantage of the blanket over the pannel:—

1. It answers the double purpose of covering the horse as well as a protection of the back; the pannel does the latter only.
2. It saves the expense of pannels, as a horse blanket must be carried, either on or off the horse, though pannels are used.
3. If the horse blanket is carried on the horse, as well as the pannels being used as in the Italian equipment, the weight is doubled unnecessarily by pannels.

4. The blanket does not move with every movement of the saddle, as the pannel does, and so scrape the surface; there is, I believe, less movement in every fold, as it gets nearer the back; this would appear a theory, but I have derived it from the observation of horses which came in sweating after work. When ridden with pannels the shape of pannel is observed on the back, whereas when ridden with side boards and blanket, you cannot discern the shape of the side boards on the horse. Again, the hair on the back of a horse ridden much with pannels, and where the pressure is uneven, will become closely shaven, as if with a razor, and sometimes bare of hair altogether; although in neither case actually sore, it is liable to be so; this will never occur on backs ridden with blanket.

5. Every time the blanket is unfolded and refolded, it is to the saddle what teasing pannels would be, it becomes quite soft, and the bearings are not in precisely the same way as before; to put it in another way, it must feel to the horse what it is to an invalid with a weary back when his bed is made afresh; and when it is considered that this can be done in a few moments in the middle of a long march, no one can but allow that it is of inestimable value.

I may be told that there is danger in doing this for fear of not putting it properly together again; there may, of course, be isolated cases of such occurring, but the general good derived would far outbalance any such. During the late mobilization manœuvres at Portsmouth, the horses of the Yeomanry regiment which I command had to do exceptionally hard work, owing to having to

perform troop and regimental drills as well as night and day attacks in connection with the mobilization, and I attribute the *good state of these horses' backs*, to which Veterinary-Captain Smith can testify to the way the blankets were being constantly shaken out and refolded, and the numdahs reversed.

On one occasion, when out at regimental drill, all the saddles were taken off the horses, every strap and buckle undone, cloaks unrolled, numdahs and blankets detached from saddle and shaken out, and then, for regimental competition for the best turned-out troop, they were put together again by the yeomen themselves on the field, the regiment proceeding as soon as mounted straight to a divisional reconnoitring field-day for four or five hours without any casualty occurring.

This, of course, was a much higher test than I advocated when suggesting the advantages of shaking out the blanket only, but I instanced it to show how a much more difficult performance could be got through without harm resulting.

Now, as to the best way of folding a blanket, the best plan is that which is easiest: I have found the plan of folding a blanket 6 feet square in three equal parts, double it, and then place on numdah, the best. It can be easiest done by one man, which I will practically illustrate, and, if thus folded, placed on the numdah, the straps of which are buckled up to front and rear of saddle, it is a total impossibility for it to shift or work out behind. The blankets in our Cavalry service are, I think, folded differently, so as to have more folds on the side boards than on the back; this is right in

theory, but in practice I notice the extra thickness is inclined to slip down, and so make a ridge under the side board.

I cannot see how the blankets shown with the foreign saddles are kept in their places. I may be told they never shift; but, on the other hand, I have been told they often shift. The tendency of a blanket when put next to the horse's skin is always to work back, the reason, I believe, being that the lie of the horse's hair is from front to rear, and so causes the blanket to move on the same principle that an ear of barley will creep up your arm if you put it inside your shirt, but anybody who does not believe me can try the experiment by placing an ordinary blanket on a horse's back and an ordinary plain saddle on it, when, after riding for some time, he will find the blanket gradually disappearing from in front and coming out behind. I know the plan alluded to in the book "Saddles and Sore Backs" of turning back the front bottom corner; this may do very well when the girths are tight, but when they get slack away will go the blanket. I believe the only sure and best plan in every way is not to place the blanket next to the horse, and so keep it out of temptation's way, but between the numdah and the saddle. I have done this, with great success, for the last nine years in my Yeomanry, and our Cavalry have adopted it for the last few years.

A blanket is hot on the horse when close to the spine, but with a numdah buckled up in front and rear of the saddle and well hollowed out along the top, there is a channel of air the whole way down the back, and when

the horse comes in from work, the spine will be found to be perfectly cool, no matter how the part under the side boards and flap may be sweating.

If a blanket gets mud or gravel into it, a few shakes when folding will soon get rid of it, and stones naturally tumble out, and if the blanket is wet it will be a little heavier certainly, but soon dries from the warmth of the horse; and as far as padding goes, it is none the worse for being damp.

The following are the sizes and weights of the blankets :—

Austrian	..	9 feet by 5 feet	..	10 lbs.
Danish	..	7 " " 6 "	..	5½ "
British	..	6 " " 5 "	..	5 "
American	..	8 " " 6 "	..	4 "
Italian	..	6 " " 5 "	..	3¾ "

Numdah Pannels.

Now I turn to a third means of softening and correcting the fit of a side board, viz., numdah pannels. These we find in the Belgian and Greek Artillery saddles, and they have been tried in our service too. I look upon them as unnecessary if you have a stout, thick, serviceable blanket and a good numdah; they may stretch, though their advocates will stoutly deny this; and they, of course, increase weight and expense, and I should not like to trust them alone without a blanket.

Numdah.

The numdah is a rarity in foreign saddlery, appearing only in the Danish, and there, in a very exaggerated form; in the Russian it appears in a two-fold form, and there, also, I venture to think they have more of it than necessary.

We have in our service used the numdah for a long time with very tolerable success, its worst feature being that where much pressure comes constantly in one place it gets greasy and hard; to clean it, the soldier uses his own nails or the currycomb, and so destroys the surface and a roughness, or hole comes which renders it worse than useless. To obviate this I invented a reversible numdah so cut, that it can be used either side next to the horse or either end to the front; thus there are four ways of wearing it, all equally the same, and if shifted every day it would never get into grease spots; this I have tried now for over eight years with great success; our saddlery equipment authorities adopted the shape, but have sewn the straps on in such a way that the numdah can only be worn one way, thereby entirely frustrating the object and consequently the benefit; the reason being given that the numdah was liable to be torn near the straps. This has always been a possibility with the Government as well as numdahs; but I have now had the straps sewn on to the felt and the felt itself sewn in a way which will render it untearable even to the strongest dragoon, who will put his whole strength into it with the laudable desire of getting the numdah tightly strapped up into the fork of the saddle. This numdah is fastened in front by the above-mentioned straps over the front arch to a buckle on the saddle, and

behind by a similar strap to another buckle attached to the cantle. This ensures the free passage of air between the back and the numdah, and prevents the possibility of the blanket, which is between the numdah and the saddle, shifting back.

Girths.

There is a great and interesting variety in girths. Six saddles have the leather girth, some of which are as hard as a board, two have a web girth like plain saddles, one has a brown canvas girth, two have strong girths, and one, the Russian, has the most remarkable, *viz.*, two pieces of raw hide about a foot apart; the American, a horse-hair girth, and the French a number of pieces of broad webbing.

A good saddle which will stop in its place is not so dependable upon a girth as a bad one; of course, plain leather is durable, but it gets precious hard, when it becomes liable to crack. I am inclined to favour the principle of the Russian two raw hide thongs far apart over the tree as well as under the belly. It certainly is most uncommon, and appears to carry out the principle of wide bearings to a greater extent than any of the others do; this principle is found in the cow-boy saddle. The American horse-hair is bound to be a good one.

Breastplate and Crupper.

There is nothing very remarkable in the way of breastplates, except in several instances their absence where they existed they appeared to be more for ornament than for use; but I do not think it would do for our

cavalry to give up their use, as the country over which they are employed at home and abroad, embraces many a steep hill where a breastplate would be found necessary. I could only find one saddle with a crupper, *viz.*, the Greek Cavalry, which shows there is a strong feeling against that instrument of torture which, whenever it came into play, used to gall the tail. A saddle can go over the tail, but cannot possibly pass over the head, which argues that the retention of a breastplate is more necessary than that of a crupper.

Wallets.

In twelve out of fourteen saddles under discussion, there are wallets; the foreign wallets appeared to be all more capacious than the British, except the Russian, which looked like small kit bags.

The Americans and Italians do not appear to use wallets.

One thing I remarked about the foreign wallets was, that they all have a buckle and strap to fasten the cover instead of the stud and hole which, when a wallet is packed full, has broken the nail of many a British dragoon in his endeavours to fasten it. I recommend this to notice.

Buckles.

I noticed that nearly all the buckles were either galvanized, black, or brass. We have always had steel buckles in our service. Life Guards, I believe, excepted. I used brass buckles in my equipment for yeomanry,

and find them serviceable, smart-looking, and easy to clean. I am happy to see they have been introduced into the latest pattern Woolwich Saddle, and I hope they may be continued.

Shoe Cases.

Shoe-cases are few in the saddles shown. The Austrians carry one, half under the flap of the saddle; the French, as I remarked, carry one of a very good shape, and I think the Hungarians carry one; but these beside the British were all I could see.

Seat.

Now respecting seats of saddles: this is a very important subject for the man's back as well as for the horse's back.

For the man, because a bad seat wearies him out and renders him useless for all his duties after coming in; for the horse, because it so much depends upon the way he sits in the saddle whether the greater weight, the man, is evenly distributed on the side boards.

For choice, I should say to look at, the old Greek post-boy saddle, and the Dutch and French were amongst the most comfortable to sit in, and there were several which looked most uncomfortable.

The majority appear to favour the long cantle behind the saddle; this I have often heard severely criticized by men who do not belong to the mounted branches, and I was very pleased to see that the long cantle was

so much favoured by Continental armies. I look upon it as essential, for the following reasons : — It assists a man materially in mounting ; it is the only possible safe way of keeping whatever is carried behind the saddle off the horse's back, and it helps to keep a man in his saddle in hand-to-hand encounters.

I watched a regiment for some years doing the annual sword competitions, and there were a mixture in the regiment of the wooden-arched saddles with the high cantle, and the iron-arched saddles without any cantle ; and I invariably noticed that the man in the former saddle had an advantage over a man in the latter. When it came to a collision, or the horse reared or plunged, or a very rough thrust was made, I have seen a man driven over the hind part of his saddle and succumb over the horse's tail out of a low-backed saddle ; whereas, under similar circumstances in the high-cantled saddle, he would keep his seat. It was very noticeable that when a man was unseated, it was almost invariably out of the saddle without the cantle.

It is difficult to compare the length of seats : as with the high peaks it is not easy to say where the seat begins and where it ends ; but the usual lengths from the front of saddles to the hole in the cantle varied between 17 and 18 inches. The length of a saddle must be determined to a certain extent by the way the men are ordered to ride ; as if they ride with short stirrups, the seat should be longer than if they ride on their forks with longer stirrups. The danger of a long-seated saddle is that when tired the men will lounge back in their saddles and so bring all the weight in one place, *vis.*, where

the side board begins to curve up under the hind arch; but in a short seat the men must sit up.

I noticed that a good many of the saddles had a strong piece of leather stretched from the front to hind arch, to support the seat; this was fastened in most cases by thongs to the side boards; it seemed in some to make rather a ridge down the centre of the seat, which is very uncomfortable. I decidedly admitted the Dutch seat, which appeared to be made of double strips of leather sewn together. The American, of course, was the simplest, as there was little or no seat at all.

Flaps.

Five of the saddles had the flaps and seats combined in one; three saddles had stuffed pads in front, which I should have thought were unnecessary; two had a great amount of leather, *viz.*, the Austrian and Greek Artillery; the American none at all: and the Dutch a very peculiar flap, much broader at the lower part than the top. I certainly think that for comfort and utility, saddles like the French, British and Belgian seemed the best, as far as the flaps were concerned.

Stirrups.

Some of the stirrups looked very heavy, noticeably the Austrian and Greek; but they evidently laid great stress on roughing their stirrups to prevent the foot slipping. The American I have already described.

Saddle Bags.

Five of the saddles carried saddle bags; this, of course, is a very convenient and commodious way of

carrying kit; but a veterinary-surgeon will tell you that owing to the configuration of the ribs of the horse, weight should not be carried on the place where these bags are always hung; they are certain to make horses sweat a good deal, and they get knocked about very much with close work in the ranks. They may be all very well for a pack-horse, which goes along by itself, or in a string at a slow pace; but I should not choose them for cavalry, who have to ride close, and do sharp work.

Carbine Bucket.

It was difficult to discover from the equipments how the carbine was carried, and only in four saddles could I see any rest for it on the saddle, which leads me to suppose that the majority of the foreign cavalry carry the weapon entirely on their back.

In the British it is carried in a long bucket; in the American, in a very short one, both behind the leg; but in the Dutch and Danish, in a very small bucket, in which only the muzzle fits in front of the leg; this is the way our Cavalry carried it about twenty-five years ago, the best illustration of which I have seen in an electioneering squib, in which Lord Salisbury, dressed as a dragoon, is settling his chief political opponent.

As far as the horse is concerned, the best place for the carbine is on the man's back, as it saves the weight of any equipment required to carry it, and the consequent chance of damage to the horse from it; it also prevents the upsetting of the balance of the saddle when the

carbine is carried entirely on one side, but it must weary the man very much and interfere with his skill as a swordsman.

Our gallant Chairman is now experimenting on this subject, and has, no doubt, hit on the right principles, *viz.*, that the weight should be divided between the man and the horse, and that the carbine should be so attached to the man that when he is parted from his horse he should not also lose his carbine; this, since the sword has been carried on the saddle, has become all the more necessary, and I trust he will be successful in achieving so desirable an object.

Weights.

The comparison of weights of the various saddles is a very difficult one, as they carried a great variety of equipment; but I made the following comparisons:—

	lbs.
<i>Italian</i> .—Saddle, breastplate, girth, sheep-skin, stirrups	31
<i>American</i> .—Saddle, carbine-bucket, girth, surcingle, stirrups	20½
<i>Dutch</i> .—Saddle, breastplate, girth, carbine, bucket, wallets, stirrups, straps	25
<i>Austrian</i> .—Saddle, wallets, girth, surcingle, stirrups, straps, shoe-case	30
<i>French</i> .—Saddle, girth, wallets, stirrups, breastplate, shoe-case	30
<i>Danish Cavalry</i> .—Saddle, girth, wallets, surcingle, stirrups	27¼
<i>Danish Artillery</i> .—Saddle, seat, girth, breastplate, stirrups wallets, strap, carbine-bucket	18¾

lbs.

Belgian.—This equipment being fully packed, I did not weigh it, as it could not thus be compared to the others.

German 32½

Greek Artillery.—Saddle, wallets, shoe-case, breastplate, girth, stirrups 28

Greek Cavalry.—Not weighed.

Russian.—I had not weights enough for this equipment.

British.—Saddle, carbine-bucket, wallets, girth, surcingle, shoe-case 27

From the above weights the Danish Artillery would appear to be a very light one, and it certainly has a very strong, if not the strongest, tree shown. It beats even the American in lightness, which has so little on it.

It is of course most desirable that a horse should carry as little as possible; upon that every one is agreed; but, to stand the rough work to which a cavalry saddle must be subjected, it is necessary it should be of strong construction; this means weight. Again, to keep the man in health, to enable him to look after his horse properly, it is also necessary that he should not be separated from a change of clothing and a waterproof sheet, and that he should carry a few articles for looking after his horse and equipment. This also means weight, and must be taken into consideration when trying to reduce weight; without the above necessities the horse will probably suffer more than he would from the extra weight which they entail.

Story of the Saddles.

I find the story of the Saddles in England since 1855, is shortly this :—

Commencing with the Nolan pattern wooden arch, a committee recommended total abolition of blanket and substitution of pannels; this was, I believe, mainly because the blanket would slip back.

There being complaints of leather seats in India breaking away from the wood, the Principal Superintendent of Stores at Woolwich introduced, in 1868, a saddle of which the seat was strapped round the arches instead of rivetted, and substituted iron instead of wood arches, which saved cost in manufacture. These were found to be miserably weak, and had to be strengthened from time to time by various patterns, each one costing more than its predecessor, until we have arrived at a tree which costs more than double the original one, which was discarded partly on account of expense. The following are the prices of the tree without leather work :—Nolan, 1855, 14s.; iron arch, 1868, 12s. 6d.; steel, 1890, 30s.; and the price, I believe, is still rising. It is for this reason that I recommend the trial of a tree like the Danish; wood is lighter, cheaper, easier to repair, and stronger than iron; there is lots of beech to be had in England, and if there was a demand for it, it would be kept the necessary time before being used. During the Franco-German war the French suddenly wanted a lot of saddles, and came to England for them; we had been making our saddles of iron, and had no seasoned beech; therefore they had to be made of elm, and were not a success.

I consider we are deeply indebted to Continental military authorities who have been so good as to contribute to such a valuable collection of saddlery as was shown at the Saddlers' Hall. I trust they will gain more by being able to take hints from other countries than they lose by having their own good points copied. To look upon it from a humanitarian point of view, that noble animal, the horse, cannot, I hope, fail to benefit, not only in having his burden lightened, but in having what he is obliged to carry placed on the back in the position most comfortable for him to bear it.

The British Army are also indebted to the Saddlers' Company, who have with such open-handed generosity given them and the public at large the opportunity of seeing all the foreign equipments and comparing them with their own, and I trust that much advantage will accrue from that comparison.

But we should not bolster ourselves up with the idea that everything English is the best, and that nothing is to be gained from the experience of others. To sum up, after a careful inspection of the foreign saddlery, I have come to the conclusion that in the way of arches, side boards and seats we have much to learn, and though strongly holding to the method I have advocated of carrying the blanket between a reversible numdah and the saddle (whatever it may be), I am inclined to think we are on the wrong tack still as regards the framework of our saddles, which are expensive and difficult to make; and I should much like to see a combination tried of the best parts of the various equipments, such as arches and side boards of the Danish Artillery, seat of the Dutch,

side boards of the Austrian; and I therefore take this opportunity of entreating our War Office authorities to make an endeavour, through the Foreign Office, to retain in England this valuable collection of saddles, where they can be seen not only by our own army but by representatives of other armies, to the mutual benefit of all concerned.

The End.

Great efforts have been made of late in all our Departments, whether Saddlery, Veterinary, or Regimental, to arrive at a good saddle, and to make it an efficient one, until, I believe, the authorities at the Horse Guards have quite lost patience with the Cavalry Service, and are inclined to fix on any pattern, and order it to be made by the thousand; but we do not, from the Exhibition at the Saddlers' Hall, appear to be the only nation who are trying to improve themselves in this respect; so I trust that after this most important exhibition a pause may be made to consider whether we are wise or not in the line of saddlery which we are at present pursuing, as now is a very critical time. I cannot find that there is any regulation British pattern at present approved, as I understand there is another even later than the 1890 pattern about to be issued for trial. Gentlemen, the subject which I have had to deal with is a very interesting one to Cavalry officers, and a most important one to the whole army. Cavalry still are the eyes and ears of an army, and to enable them to perform their duties, it is above all things necessary that they should have the very best saddlery equipment which can be provided for them; and I shall feel very

proud if any remarks which I have made in drawing attention to the merits and demerits of our neighbours' will lead us in that direction.

The CHAIRMAN: We must all agree that Colonel Crichton was right in saying, that this is a subject of the utmost importance to the cavalry. I do not think any one could have done it more justice than the lecturer. The interest taken in the subject is shown by the presence of so many Cavalry officers, some unfortunately now lost to the Service, men who have studied it equally with Colonel Crichton. I also see some gentlemen present who are experts in saddlery, and who have made the theory of building saddles the subject of their life-study. I hope we shall hear some remarks from them, and also from gentlemen in the Veterinary Department of the Service, if they will be good enough to give us their opinions with regard to what has been said.

Major PHILPOTTS, R.A.: I want, with your permission, to say a few words with regard to the Hungarian saddle. It was a saddle sent to the Exhibition from the Royal Artillery Institution at Woolwich. It belonged to the 2nd Guard Uhlan German Cavalry. They call it the Hungarian pattern; but it is not really the Hungarian saddle, it is the German saddle. The seat, instead of being made of raw hide, like the Austrian, is made of ordinary brown leather. It has side bars like the Turkish, and in a great many points it resembles the Turkish saddle. As the lecturer has said, the shoe-pocket is a very excellent arrangement. It is fixed on a vertical slot in the upper part of the shoe-pocket which slips over the D on the tree, and is kept in its place by means of the near side baggage-strap. The cloak is not fixed in the same way that ours is fixed, but with the three baggage-straps in rear of the saddle. There is an arrangement for carrying corn—a bag laid across in rear under the cloak. On the near side stirrup-iron there are two buckets for lances, one on the off side, for dismounted work. The saddle may look heavy, but is not really so, and in use will be found thoroughly workmanlike. The side bar measures 5 inches by 21. The blanket seems most excellent. It is not quite as thick as the Austrian, but is of excellent material,

better than our present Government brown blanket ; it is much thicker and will wear much better. It is kept in its place by the front corners being turned over and fastened by means of the girth-straps. I believe they do find that it sometimes slips. It measures 7 feet by 7 feet 11 inches, whereas our blanket measures only 5 feet 6 inches by 4 feet 10 inches. It would be most useful for the horse on the picket lines. Our blanket very soon gets worn out, and would not, I fancy, be of much use on a wet night. The pilch is something between the Turkish and the Italian. The stirrup-irons certainly look heavy, but they are very similar to our new pattern. The weight of the saddle with one shoe-case, breastplate, girth, wallets, and surcingle, is 32lbs. It has one shoe-case on the near side, and on the wallet, on the off side, there is a place for another shoe.

Colonel E. A. Wood : I only want to make one remark connected with the American saddle. I had a Whitman saddle sent over for me to try in the 10th Hussars in 1884-85. I gave it a thorough trial and was very much gratified with it. There is one point that does not appear in the drawing, namely, that the saddle was supplied with the horse-hair numdah. There was with it a small square horse-hair numdah which fitted between the blanket and the saddle. Although there was no breastplate or crupper, the blanket never moved an inch, and I believe that was simply because it was a horse-hair numdah. I tried afterwards to get the same numdah at the Horse Guards, but I found it was lost. I believe that to be a most important point. The Americans evidently find some advantage in it, or they would not use it under the blanket.

Lieutenant-Colonel HURROX (Commanding Mounted Infantry) : Perhaps, first of all, an apology is due from me for taking up this question at all, seeing that I am not a cavalry officer. I have, however, gone very carefully into the question of saddles for a number of years past. In fact, I went over to America some years ago for the purpose of studying questions in connection with mounted troops and the Whitman saddle, and the American saddle equipment in particular. The whole question of military saddlery must turn upon the weight to be carried on the saddle. I think, before considering the question of

military saddles, we should consider really what weight the saddle is to be required to carry. Many foreign nations have adopted saddle-bags, whereas this country and several others have retained the old method of carrying the kit and other *impedimenta* upon the top of a heavy saddle or superstructure raised above the horse's back. The first consideration is the weight to be carried on the saddle; and the second, the position in which that weight should be placed. First, as regards the weight. It has been laid down by Professor Smith and other authorities that the weight to be carried should not exceed something between one-fifth and one-sixth of the weight of the horse itself. In the case of an English troop-horse, which weighs about 1,000 lbs., the weight would be about 15 stone. In the case of smaller horses, of which I have personally had considerable experience in different parts of the world, weighing from 800 to 900 lbs., the weight should be from 13 to 14 stone. The weight of the saddle, which Colonel Crichton has given as the English saddle, is stated to be 27lbs. No authority for this statement is given, and in the only tables we have to go upon of an official kind, published with the Army Orders of 1888, the weight of the regulation saddle is put down at 3st. 5lbs. or 47lbs. By the Cavalry Transport Regulations, the English Cavalry soldier rides from 18½ to 22 stone, or from 3 to 4 stone above what any horse should be called upon to carry. The same relative weight by regulation holds good for mounted infantry, who, by regulation, is to ride 19½ stone, or from 6 to 7 stone above what any small horse (Arab, Cape, American, or Irish cob) can carry. Are we, gentlemen, in the future to overweight our horses in this absurd manner? If as commonsense dictates, the weight of a cavalry soldier is to be reduced to 15 or 16 stone by relegating all superfluous kit and paraphernalia to the baggage-wagon or pack-horse, surely it will be unnecessary then to place 47lbs. of saddle and saddle equipment on the horse's back. Secondly, as regards the position of the weight on the horse's back, I know that most authorities agree on the necessity of the man's body and all deadweight being brought as low upon the horse as possible. This object is best met by the American saddle, an adaptation to which has been proposed by myself and strongly advocated by several officers high in authority, the weight of the man's body is, with this saddle, actually upon

the horse itself, and is not raised upon a tree or superstructure as in the case of most other military saddles. Oscillation is obviated by this means, and a much lighter saddle can be used, which, however, should, of necessity, have a saddle-bag to carry any extra kit or *impedimenta*. I know of no description of military saddle which better meets the necessity of lightness, cheapness, and durability than the American saddle. The lecturer alluded to the wooden tree of the American pattern saddle and to the possibility of its being broken or getting out of order. This is, no doubt, a difficulty; but the Whitman Company, who make for the American Government, shrink hide over the whole wooden tree, and that to a very large extent strengthens it. The lecturer also referred to the material for making trees, *viz.*, wood or iron. To a great extent the material depends upon the climate in which the saddle is going to be used. If it is to be used in a country where there are great changes of temperature, the iron tree is not advisable, because the changes of excessive heat and cold cause the metal to expand and contract: and this is one reason why the Americans have adopted wooden trees. With reference to the Belgian saddle, which Colonel Crichton has specially brought to our notice. It is worthy of remark that the Belgian soldier rides from $14\frac{1}{2}$ to 15 stone, and that he is the lightest equipped cavalry soldier in Europe. Colonel Crichton referred also to the length of the side bar. The length of the side bar must depend entirely on the length of the back of the horse. American horses, like our own colonial breeds, are short in the back; therefore the side bars can be made proportionately short. Colonel Crichton also referred to numdahs. My experience in different parts of the world on active service convinces me that it is practically impossible to keep any description of numdah in a serviceable condition. It picks up mud, dirt, and sweat from the horse's back, and, after a time, no matter what pains and trouble are taken, the numdah will get hard, and so perfectly useless. As far as blankets are concerned, I am fully convinced that Colonel Crichton's views are sound in respect to the advantage of having a blanket with a numdah to begin your campaign with. The numdah, after a short time, must become unserviceable and you can then fall back upon your blanket; but if you

start with a blanket alone, its texture gets thin sooner and it suffers in proportion. With reference to saddle-bags, Colonel Crichton pointed out that the great drawback is that they are carried on that part of the horse which is the weakest. This, no doubt, is the case with the patterns which he has brought before your notice to-day, except that of the American Government, and this defect is conspicuous in the case of the Italian saddle equipment. In this instance the whole weight of the saddle-bag in which the kit is carried, hangs over upon the short ribs of the horse, which is the weakest part of the horse's back. The saddle-bag which the American Cavalry use, and an adaptation of which has been strongly advocated, hangs below the rider, practically in a line with the 14th vertebra, the centre of gravity of the horse, and rather in front of it. With regard to the carriage of the rifle and carbine. This is a subject upon which much controversy exists among Officers of great experience in campaigning. My own experience is, that it is impossible to carry the present magazine rifle, weighing $11\frac{1}{2}$ lbs., upon the saddle. It is not practicable to balance so great a deadweight. This argument must hold good also as regards a magazine carbine. The carbine as it is now carried can be balanced at starting by the 8 lbs. of corn, on the near side, but as the corn is consumed so is the balance of the saddle destroyed. The rifle, and I venture to think also the carbine, must be carried on the man's back. I know that some Officers hold that the physique of men campaigning will not stand the weight of a rifle for any length of time. I have always found that it is a mere question of habit, and that men get wonderfully soon accustomed to the weight. To give an instance, during last autumn, with men comparatively untrained and little used to campaigning, it fell to my lot to march 70 miles in sixteen hours in order to test this very point. The magazine rifles (11 lbs. deadweight) were slung over the men's backs by means of a broad buff aling attached to the rifle by adjustable metal fastenings. The men, after marching 57 miles, were halted for a quarter of an hour or twenty minutes to grieve the horses. Though the men were allowed to take off their rifles if they wished, not one availed himself of the permission. The march was then completed, and the men complained in no way of the weight

of the rifles, either upon that night or the following morning. We can only hope that this interesting lecture to which we have listened may pave the way to a reduction of the weight to be carried by mounted troops and to the provision of a light and durable saddle and saddle equipment, upon the lines, perhaps, of that in use by the American Cavalry.

Veterinary-Captain SMITH : I am sure we are all exceedingly obliged to Colonel Crichton for putting this matter before us in the way he has done ; his lecture has prevented these foreign saddles being entirely lost to us. The point, I take it, is simply, what have we got to learn from an examination of this saddlery, and how far can the good points be applied to our own particular purposes ? I hold that it is utterly impossible by a mere examination of the equipment to settle what points are likely to be of any service to us, unless, as the lecturer pointed out, the whole thing be put to a very thorough test. I am afraid we have not hitherto given our saddlery equipment that severe trial which it certainly needs, in order to settle the best type of saddle to be adopted. It is certainly absolutely necessary that no important article of saddlery equipment should be adopted, unless it has undergone at least a 200 or 300 mile march under trying conditions. I cannot think, however, from the little I know of the subject that this collection can be taken as representing the pattern of saddles which exist on the Continent. Unfortunately the German saddles are not represented at all. I believe they have at least three or four different types of saddle, which it would have been very interesting to us to have learned something about. The French also have three or four types, and certainly the drawing of the English saddle does not represent the sole type of saddle used in our Service at the present day. On this point I may say that Colonel Crichton has referred to the horse, covered over with sores, which figures in my "Manual." Of course, I did not mean to say, for one moment that any one horse ever presented so many injuries on his back ; but I may add that the saddle which is capable of producing those injuries exists at the present day in exactly the same way as it existed at the time I wrote that pamphlet.*

* The lecturer's remarks would lead one to believe otherwise.

Colonel Crichton refers to the "points" of the saddle. The object of the points was to prevent the saddle from turning when a man mounted in a hurry. You find exactly the same "points" in some saddles of the armour period, which run not only from the front arch but also from the rear arch, extending some considerable distance below the rib. Referring to the fit of the side bar, I may say that it is as necessary that it should fit as accurately in its depth from top to bottom as in its length from front to rear; but owing to the fact that the curve of the side bars from top to bottom is shorter than in their length, it does not appear to be so important. The Austrian steel side bar does adapt itself, not only to the varying shape of the back in its width but it also adjusts itself to the curves from front to rear. Perhaps, however, (and here my opinion is opposed to that of the lecturer,) the important point in the lecture, so far as the Service is concerned, is the question of pannels *vs.* blankets. There is fashion in everything; and, at the present day, the fashion in saddlery is the blanket. But I hold, that so long as we have our saddles made up with rigid, unyielding side boards, that it would be almost impossible to expect our backs to be kept in a perfectly satisfactory state, if we simply have a blanket placed beneath the saddle. Let me say why I believe the pannels to be superior to the blanket. The explanation is this: the hair in the pannel has a tendency to shift, and to adjust itself in such a way that a side board, which does not perfectly fit the horse, is made by the adjustment of the hair in the pannel to fit him fairly well. I do not say to fit him as well as the Austrian automatic tree—very far from it; but certainly it fits him better than a blanket folded in a certain number of folds, equal in thickness from front to rear. I conceive, therefore, if we have to use the rigid side board, the hair-stuffed pannel beneath the saddle is essential. How is it, however, that pannels have been brought into disrepute? Simply for the reason that we reduced the amount of hair in the pannel from 3lbs. to 1lb. 4oz.; and when we reduced the pannels to that extent we rendered them practically useless. You might just as well put a certain number of sheets of brown paper beneath the saddle, for they would have done equally well. If we place more hair in our pannels—if we

come back to the original 3lbs., we might use the unyielding side board and have a fair amount of success, whatever length of campaign we were called upon to undertake. Another advantage in the pannel (and I find the lecturer did not think very highly of it) is the chambering which a pannel can undergo, and which, of course, you cannot possibly apply to the blanket. You can chamber your pannel in such a way—and I speak with a certain amount of experience on this subject—that you may work your horse without any danger of the sore-back getting worse. That is a most valuable circumstance, and one which should not be lost sight of. At the same time, I am a firm believer in the use of the blanket to make good the condition which the horse has lost. There can be no doubt that a good blanket will be essential in future. We cannot possibly discuss this question of saddles apart from the horse. What is the use of saddles? The use of the saddle, in the first instance, is increased comfort to the rider; but it is something very much more than this. The next use is to distribute over the horse's back the weight which he has to carry. We could easily distribute this weight if all parts of the back were capable of bearing pressure; but we know perfectly well that there are certain parts of the back which are not capable of bearing weight. There are some parts that we must be most careful to avoid. Still, the distribution of weight may be readily carried out, in spite of this fact, if on all parts of the back the pressure could be imparted in the same particular way. We know it cannot. The pressure you put upon the back behind, is totally different from the pressure in front. In other words, the pressure on the rear arches is totally different from the pressure on the front arches. It seems to me that even these difficulties might be overcome if all horses had the same size and shape of back; but they have not. But the most serious difficulty of the whole lot is, that when horses are undergoing severe and violent work, their backs are changing in shape. The muscles which were plump and full before they left barracks have now commenced to become wasted; they get hollow, and we have from the shoulder to the loins a huge gutter formed. Practically, from the saddlery point of view, the muscle on a horse's back simply represents so much stuffing, the object of which is to prevent the ribs from getting bruised: for the horse

does not carry the weight upon the back, but upon the ribs; and, since we have a loss of flesh upon the ribs, obviously the more the weight of the saddle and man is brought upon the horse, and injury results. Therefore, this constant alteration in the shape of the horse's back as the result of work, tells us that we must have a tree which will adjust itself, in order that the side bars may lie evenly on the back. That is a very important point in the Austrian steel-fitting tree, where, to bring it about, we have a certain number of hinges introduced in a most ingenious manner. I can speak from experience on this subject, because General Keith-Fraser has permitted me to try the saddle for some considerable time. I have had it on a large number of horses, and have never found a horse yet that it could not fit. With our own Service saddle, the difficulty is to find a horse that will fit into it; with the Austrian saddle the reverse is the case. It automatically adjusts itself to the varying shape of the horse's back. The side bars, open or close, depending upon the size of the muscles of the back; and, therefore, we always have the weight distributed equally from front to rear, and from top to bottom. With this kind of tree you can place your blanket underneath of the same thickness throughout, and you have your man's weight equally distributed; but until we have got a self-fitting tree, I hold that we will find it necessary, when we call upon our horses to perform anything like severe work, to have good pannels on the saddle and a good blanket beneath them.

Veterinary-Colonel LAMBERT: I wish to make a few brief remarks with reference to the saddle-tree. I happened to see a copy of an original Moorish saddle and a Mexican saddle, also of an old Spanish saddle—all, of course, derived from the Moors. It was rather a remarkable thing to notice how, in the whole of those, the original saddle-tree used long before the Mahommedan era by Oriental nations, is still retained. It is the parent of our military saddle-trees, and, though called the Hungarian, was for ages employed before the Hungarian nation came into recognized existence. I have had great experience with the blanket on service. It was extensively used in the Zulu campaign by the 17th Lancers, of which regiment I was the Veterinary Officer. I do not know how we could have got on without the blanket. We had the numdah, but we also had a very large

thick blanket. It weighed about 8lbs.; and was of a fawn colour. We found it a very great success. There is one advantage of the blanket as to which I do not quite agree with Professor Smith regarding its merits as compared with pannels, and that is, we found that if you have an abrasion or a slight sore, with a blanket you can often still go on working the horse, and very frequently it does not appear to get any worse from any chafing by the blanket. With a pannel, however, it is different. You cannot on service conveniently chamber the pannel, and the horse will therefore only get worse. We know that horses on a campaign, if they are not properly foraged and are hard worked, lose flesh rapidly, and then their saddles will not fit. No thickness of pannels would obviate that, and, besides, you would not have in the field the means of re-adjusting the pannels so as to fit. You could, however, fold a blanket as you like. The blanket has been tried in earlier wars, as will be seen by an extract from a book published by General George Hanger in 1814, in which he said, "In the British Legion in America we had no sore backs. Our blanket, six or eight times doubled, was always laid between the horse's back and the saddle. If our cavalry on service could have a blanket eight times doubled under the saddle it would be of great utility, and you will never have a horse with a sore back." No doubt he exaggerates in saying "never," because you are certain to get sore backs, however careful you are. A great deal depends, of course, upon the work which has to be done. With regard to the numdah, as has been said this afternoon, it gets out of order, and, in the 17th Lancers, in Zululand, we found that it did so very often. When this occurred the numdah was discarded, and the blanket was used alone. Of course, it seems quite a minor point as to what the colour of the blanket should be. In the artillery, in Natal and Zululand, for instance, a white blanket was used. We find that a good many foreign nations use a white blanket, and the reason is this. If you have a dark-coloured blanket the dark colour allows of the fraudulent employment of inferior material, which is, however, easily detected in a white blanket. The blanket must be of good substance, a flimsy light one is a very great mistake. It has always struck me as disadvantageous to send a saddle right away to be tried by regiments, because every regiment tries a saddle in a different way, and

very often from different points of view. I think it would be well for any Saddlery Committee to have all trials made within its easy reach, so that its members might go at least once a week to see how matters were going on, a most important point.

Mr. BYWATER : I have listened with great interest to this lecture. Amongst the important subjects dealt with is one illustrated very forcibly by the diagrams. One is struck by the diversity of the shapes of the seats of these saddles, and it is a fact that the position in which the soldier should sit has never yet been satisfactorily defined. There are a great many opinions as to whether the riding on the fork or the adoption of a hunting seat, or something approaching to it, is the more correct. Certainly for the saddler it is a most important point, because, unless he knows what is required, he is utterly at sea as to what to construct. Now the Danish saddle is as straight as the Dutch is deep ; and I should say of these two the Dutch is the better. There is no doubt that, fifty years ago, there were fewer sore backs in the hunting field than there are now, simply because the hunting saddle of those days was deep and broad, and the rider sat very much towards the centre of the saddle ; whereas with a very flat seat, such as the public now generally desire, the rider sits anywhere. With regard to the saddle which has been made for General Fraser, I may add that the bars to a certain extent have an elasticity, which enables them to conform to the shape of the back longitudinally, as well as adjusting to the grip. I do not know that I have anything else to remark, except that it will be a very happy day when the position of the rider is definitely decided.

Major-General MONTGOMERY-MOORE : I should like to mention a saddle that I saw years ago in Algeria, of which I have never seen the principle put forward since. The saddle itself, on which the men sat, was like an arm-chair. The numdahs underneath were six square pieces of cloth fastened together. I have marched many hundred miles with a Spahi there, and the Spahi sits in this saddle like a little arm-chair with a back. He can sit in as many positions as a man could sit in an arm-chair. Of course, he has only himself to carry. The principle

of the six pieces of thick cloth, which were all of different colours, underneath the saddle, struck me as an extremely useful one. The Spahi marches longer distances than any cavalry on this side of the Atlantic. He thinks nothing of turning round in the saddle and galloping off, and he will go on in a sort of canter for 100 miles. I think if, instead of either the numdah or the blanket, the separate pieces of cloth could be tried, they might be found an advantage. You can transpose the pieces next the horse's back one after another, so that if one gets hard or wet, you simply change it for another. In the long distances I have marched with them, I was very much struck with their great suitability for our saddles. With regard to what Colonel Hutton was saying about the rifle being carried over the shoulder; I have marched with the Chasseur d'Afrique, and it certainly struck me as one of the most clumsy arrangements possible at first, but, after marching long distances and talking to the men about it, the comfort that they found it, just dropping the right end behind and adjusting the butt, they say they would infinitely rather have it than carry it in any bucket whatever, and at the end of a long march the discomfort felt from the carbine seems almost infinitesimal. One has tried it one's self shooting, and in going into jungle I have always preferred carrying the rifle slung across the shoulder; it is much more convenient, and can be got at very much more easily. What was mentioned by Professor Smith is one of the most important points, *viz.*, the reduction of the condition of the horse, and that no saddle that does not allow for that as a first principle, should be considered at all. That, I understand the lecturer, is considered in the Dutch saddle. That, no doubt, is very important. Then, looking at the seats, I think the cowboy saddle gives you the idea of the most comfortable seat of the lot. The flap mentioned by Colonel Crichton is well worth trying. You get rid of weight; it moves with the leg, and seems just the thing you want for the saddle, although to the eye of the cavalryman, perhaps, it is not very ornamental.

Major J. HORTON: General Fraser and Gentlemen, I have been following the saddlery question for the last thirty years, and I am well acquainted with what the Committees have done during later years. The American pattern saddle spoken of has been brought prominently before the Services from time

to time. It has its advocates and opponents ; one disadvantage, it will not carry the kit as the Service at present consider it should be carried. Before we make a saddle we should first determine the maximum weight to be carried on it, whether it is to carry 22 or 23 stone or more. And as it is, the arches of the saddle that carry the weight, and as we find if a saddle gives way, it invariably gives at the front arch ; we must consider and determine suitably that point first. The latest pattern front arch will stand a dead pressure of 8 cwt. The saddle I see on the chair is a Nolan modified saddle, a wooden saddle, well known in the Service ; it is about the best military saddle we ever had, but it would need altering to suit present requirements. We have had several patterns of saddles while other nations have been contented with one. The French saddle now shown was in use in the French Army sixteen years ago. We fail because we will go in for lightness in the wrong place. We seem to act upon the principle of building a house and allowing the foundations to be weakened while story upon story was being added.* We must begin with the foundation of the saddle, which is the saddle-tree ; we can then add weight, but with some limit. We have a Service saddle which will only stand 4-cwt. strain on the front arch. Some one determined, until higher authorities interfered, that it should carry pickaxe and shovel and all kinds of *impedimenta* in one bag, and they were to be hung on the arch ; and this weight on the saddle was to be in addition to the marching order kit and the weight of a non-commissioned officer, who would in all probability be 14 stone. We must remember that anything above 11 stone, which is calculated as the approximate weight of the rider, must be put on the saddle as extra weight to all that is laid down in the Regulations. I knew one very stout farrier-sergeant, who was about 16 stone weight, without accoutrements. After seeing a poor horse work in marching order under him one field-day,

* I saw a saddle to-day that illustrates the point. A would-be inventor has taken a Service angle iron arch saddle-tree, which is already too weak, yielding at a pressure 2 cwt. below what is now considered a suitable strain ; and he has cut away the metal of the front arch by a series of slots, reducing its strength in consequence by 1 cwt. At the same time he has added excessively heavy iron staples and plates to the side bars, quite double the thickness and weight necessary for the purpose intended. He has added weight where it was not required, and taken away weight where it was absolutely necessary for the maintenance of strength in the vital part of the saddle-tree.—J. H.

I obtained the Colonel's permission to inform him privately, he was in future to put nothing on the saddle in his valise and wallets but straw. He was to appear only outwardly to be all right. The American saddle tried lately is not so strong as the one that was in the Exhibition, and which is the American Army saddle. One American pattern tried for rank and file was an Officer's saddle, and a very light saddle too. At the American Exhibition a few years ago I picked up the Whitman saddle, and said to the agent, who had all kinds of American saddles on sale, "This is a very light saddle." He said, "Yes; but none of the ranch men will buy the Ranch saddles from us, unless they are 40lbs. in weight." Ingenious people sometimes say, "Here is a light saddle for the British Army;" but on examination of the article it is found the straps and parts are flimsy and unsuited to last one-half the time they would be expected to. A saddle must have sufficient strength to last a reasonable number of years, which means a certain addition to weight. I had a bit the other day that was 6ozs. lighter than when it was first issued, owing to constant wear and cleaning, so that it seems to me that if everything is to be issued on the very lightest principle they will only last about one-third of the time that they are supposed to do at present, which will very materially increase expense. In reference to girths and their attachment, if we examine old prints of the last century, from plates by Wouverman and others, we shall find that the girths are shown attached to the front of the saddle. After that time we get back to central girthing. The seat in that case was very short: the man had to sit right in the middle of the saddle, almost straight-legged. One gentleman who spoke just now said, "The seat should be defined," or, who is going to define the seat? I say the seat is strictly defined, and a very good seat it is: and if we ride according to the definition given in the Regulations, we shall ride in the saddle in a manner that it will well suit. The Hungarian saddle is similar to the Austrian, only the one has a shabraque shown and the other has not. I went carefully through these saddles when they were at the Exhibition, some of which I well knew. The whole of the foreign saddles in possession of the Government, I believe, came before the Saddlery Committee some years ago. One thing should be particularly

noted, mostly all the saddles shown on the diagrams are worn with more stuffing or padding than we have been lately using. The Russian saddle depicted is a new saddle, but there is another new saddle for the Russian Army somewhere. I was struck with the very pretty way this particular set was got up. The smell of Russia leather which it had is given to it by a special preparation of oil. The Russian Service black harness and saddlery is similarly prepared. With regard to the principle of the blanket and pannels, if you put five people to decide upon this point, I am sure you will never get five of one mind. The great cause of all the trouble of the past has been that we rather exaggerate when we have to do anything. Some nine years ago the attention of the authorities was called to the fact that the saddlers, to save themselves trouble, instead of taking out the old stuffing, which was excessive, and re-stuffing the pannel, used to put a little fresh hair on the top, while the old stuffing was left as hard as a door mat. The consequence was, those who looked after regiments pointed out that the pannels wanted a little less stuffing, and that properly put in. I am bound to say, from all I saw and know of recent events connected with saddlery made public, that the faults were exaggerated, and that actual faults were caused by not having sufficient stuffing in the pannels. I will take the very worst pattern universal saddle we have, and use it on any horse in England up to my own weight without a sore back. I have seen 300 horses of a regiment march 200 miles all with these "bad saddles" on, and there was but one sore back; 150 of the horses were young, and had joined after the return of the regiment in question from Egypt. The one sore back was that of the drum horse. The pattern saddle was nevertheless faulty; it was not by any means a good saddle. And now as to pannel, numdah, and blanket. I do not care which you have; the great difficulty is none will agree (I am afraid, although wanted, if hair pannels are not used) to have all three. If you have a properly stuffed pannel and a blanket you ought to go anywhere; there is not the slightest doubt about it; but the objection is, the hair pannel requires a skilled tradesman to adjust it. My opinion is, after seeing nearly the whole of the trial and carrying many out, that you want an underlining to your side bar, so that you can adapt them,

without an artificer, to meet the longitudinal differences of horses' backs, and you want your blanket for the use that Colonel Crichton has so well put before us. Personally I prefer the numdah underlining, similar to the new saddle which General Fraser advocates. You may call it an underlining or, what it is best known by a numdah pannel. It is the best thing you can have for the purpose. It will not get stiff unless thoroughly neglected or clogged with oil and dirt other than from the horse. I inspect hundreds of numdahs returned from regiments, and I do not find six hard ones to a hundred soft. The numdah is of woollen felt, and should it get hard you have only to roll it up and rub it in your hands as I do now, and it will get soft enough. You may use your blanket without a numdah underneath the numdah pannel if you like, as the numdah has more cohesion to the blanket than has the smooth side boards. At Aldershot, ten years ago, we had for trial under the saddle 150 blankets. A General Officer carried out the trial. I saw these blankets under the saddle daily before they went to the field and when they came in. We turned the front of the blankets back to catch under the front of the saddle bars; but the blankets did work back in some cases. I may tell you it depended upon the pattern of the saddle used. We carried the plan out very well with the wooden saddle, as the wallet staple does not entirely cover the front point of side bar, but when saddles with a point plate and wallet staples on the extreme end of the bar were tried, we were not able to get the blanket to grip. The blankets as padding answered very well, but the heavier the blanket the more the horse sweated, and we found that the horses which carried the heavy blankets were a quarter of an hour or twenty minutes longer being dried, and groomed than the horses which had lighter blankets or that had worn hair pannels. The benefit of having a numdah pannel with a blanket is, that as the blanket fills up nearly the whole channel of the front arch, you may with the pannels build up the arch to suit a horse with extreme high withers. It is said you may fold the blanket in various ways to meet this difficulty: granted, but you cannot stand over every man and tell him what he should do, and if you did tell an individual you cannot see when the cloak and kit are attached whether it has been done or not. The fact is you want something along the bar that will allow you to build up an

arch for those horses which require a very high arch, about 5 per cent., and that the safety in other cases may not entirely depend upon the accidental folding of the blanket. If not, it will result in having to make high arches for every horse, and that will be a great evil, and because we have been working back for years from the high arch to the low arch. A few words in reference to the felt numdah question. Fifteen years ago Colonel Crichton strongly advocated that the numdah should be of leather. I advocated felt, as the said leather numdah smoothed over the inequalities of the animal's back, making it like a mahogany table, giving no grip for the saddle. There were also other reasons. This felt numdah Colonel Crichton now advocates was well tried, but he has changed the pattern several times since; the fault found on trial was that the stitching broke away by the bending and reversing every other day. It is not, in consequence, so serviceable as the other pattern. The self-adjusting bar saddle is not novel; the Danish and Belgian saddle have the same principle; it has been before the public in different shapes for many years. It is a good principle. One patentee has shown an adjustable bar longitudinally, made of thin flexible steel. If you dropped the saddle on the floor the bar would probably take a bend, a permanent set, that would not perhaps be seen, and which would, when in use, prove injurious. Colonel Crichton is a great advocate for brass buckles, as we all are, because they are so much easier to clean than iron ones. I have always advocated the wood arch saddle, as the iron or steel arch is always so liable to be bent by accident; the wood arch saddle is not so liable, it stands a great deal of throwing about. I have seen them in use during the last thirty-two years, and pass many for repairs daily. In the regiment I had the honour of serving in, the Colonel considered them excellent saddles, and with his permission we hung on to them, and repaired them year after year, until there was not a reparable part left.

The CHAIRMAN (General Keith-Fraser): Gentlemen, in the winter of this year at a lecture in Dublin, Lord Wolseley stated that it was not at all creditable to the Service, and especially to the mounted branches, that we had never been able to invent

a thoroughly good and practical saddle. I must say I think what we have heard to-day, the opinions we have heard on the various saddles on the walls, the pictures of which we see, and the presence of so many Officers and gentlemen of various trades and professions, shows that this subject has not escaped attention, and if the cavalry have done wrong we share the blame in very good company. For hundreds of years cavalry soldiers have been trying to get a perfect saddle, and I do not suppose in hundred years to come we shall even get it. I even very much doubt whether the boot of the infantry soldier will ever be perfect; nor, I believe, is the best description of repeating rifle quite settled yet. The boot of the infantry soldier has to fit one animal; but the tree of the saddle has to fit two animals, the horse and the man. If it does not fit both it won't do; it will ruin the horse at all events. If you do not get a good seat for the rider; if you do not get well-fitting short side bars and arches that do not spread, you will injure the horse, there is no doubt about that. It is not so much the fault of the Cavalry Officer in our Service, for a study of the Reports of Committees on Saddles for a great number of years will show that there are very few of the opinions of Cavalry Officers that have ever been acted upon. All sorts of Officers of other branches of the Service have given their opinion, and the decisions have generally been based on economical reasons, or on somebody's fanciful views on this thing and the other. The wooden saddle was given up because it was recommended as being cheaper to have the iron saddle. Another reason given was, that some of the rivets of the seats had become detached from the wooden cantle. Wooden saddles were used for hundreds of years in many countries, and up to this day in almost all European armies. The Hungarian saddle (on the lines of which the old English saddle was built) is generally admitted to be the best. One reason was, that it was extremely simple. It used to be a wooden tree and plain wood side bars, and the seat could be laced up in front to let down behind, so as to place the man in its centre. The old English Hussar saddle gave a man an excellent seat. It was a very simple saddle, and it was an unfortunate day when we began to change. That saddle went all through the hot weather campaigns of the Indian Mutiny. Someone has said

rightly, the iron arches would not stand the great heat and cold of America. In the burning climate of India the wooden arch saddle went well through the whole of the Indian Mutiny, and the number of sore backs was excessively small. Since that we have had every description of iron. We have tried everything. The experts at Woolwich told us the flat iron could not spread, but in two or three years our cavalry suffered terribly from sore backs and girth galls, owing to the arches having spread. Then the angle iron arch was brought in, and expert evidence was given that it was quite impossible that *that* could spread. The question was asked: "Did not you say the same thing about the flat iron arch?" "Yes, but this *cannot* spread." Now we all know the angle iron arch does spread. And now we have the steel arch, and even the steel arch has spread, but not much, as it has not been used very long. It is true that a certain number of saddles with the flat iron arch, the one that has given all those sores which Professor Smith has graphically described in his little book, is still in the Service, but it is at last going to be called in. The angle iron arch saddle is being strengthened with a steel bar, and that I hope will keep it from spreading any more. All metal arches will spread in time, I feel quite sure, and my opinion is shared by people of much greater knowledge than myself. One of the most important of the questions raised to-day is the seat of the soldier on the horse. I was very glad to hear Mr. Bywater draw particular attention to that. It is utterly impossible that the saddle shall remain to fit the horse if the man does not sit properly—if there is not a good seat for the man. He said nobody ever had decided what the seat of the man should be. I think there is not a bad description of the proper seat written a long time ago by Xenophon himself in his admirable "Treatise on Horsemanship." He says: "We do not like that the man should sit as if he were on a carriage seat, but as if he were standing upright with the legs somewhat apart, for thus he would cling more firmly to the horse with his thighs, and, keeping himself erect, will be able to strike a blow on horseback with greater force. It is necessary to allow the leg as well as the foot to hang loose from the knee." I think that is a perfect description of a seat. You will see the cowboys at Buffalo Bill's sitting right down in the saddle, and they can pick up things off the

ground, which a man cannot do with his knees tucked up to his nose. In the French saddle, in the '59 campaign, the men sat far back, almost on the cantle of the saddle; the result was countless sore backs. You cannot sit on the back of the saddle without pushing the saddle forward, and getting sore backs and girth galls; girth galls really are unknown in the Austro-Hungarian army. I am happy to say they are very rare (owing to the immense care taken) in our own army, still we have a few, and if you look at the English cavalry riding on these old saddles, you will find it is quite impossible that they should sit anywhere except on the back of the saddle, and that they must keep on pushing it forward. As long as the lowest part of the saddle is quite over the centre of the girth, then the man sits in the centre of the saddle, and the saddle must be placed over the centre of gravity of the horse. The man feels much less movement. With regard to what is the proper seat of the cavalry soldier, I do not think there can be any question. With regard to the pannels or blankets, there are a great number of differences of opinion. I think the chambering of a pannel is a risky thing, and you cannot get men always on the spot to do it. I know even at manoeuvres you will see the saddlers at work all night, trying to teaze and chamber the stuffing of the saddles. On service you may not have men capable of doing that, whereas the blanket can always be altered to fit. In the American War a Confederate General Commanding the cavalry said, no saddle with pannels would do; the saddles he liked best were the McClellan saddles, which they took from the Northerners. Nobody sits more down in the saddle than a jockey. That is the seat you ought to have; the man should sit down so that he can rise about 4 inches from the saddle. Some of these saddles we know something about. The American saddle is, I believe, most comfortable; it sits the man right down in the saddle, and gives him a very firm seat. I am quite sure no hunting saddle would do for the cavalry soldier. Colonel Denison, the author of "Modern Cavalry," who is not at all a cavalry soldier, and not at all infatuated with the idea of cavalry, for he was the first advocate for the creation of mounted infantry in our service, but who has seen a great deal of mounted work, when he was commanding a detachment of his own troops on the frontier, in

1866, had some of the Hussar saddles, but not enough. He found that the greater number of horses that had an ordinary hunting saddle were almost immediately laid up, and not a single horse with a Hussar saddle had a sore back. He is clearly of opinion that the hunting saddle does not suit the cavalry soldier. The Austrian saddle is a much deeper saddle than any of our present ones. The wallets hold the men's kit, and behind the saddle he carries two days' corn and his cloak. I heard it remarked that the English cavalry was so heavy. I should like to see a comparison of the Hungarian cavalry and the English. The Hungarian Hussar horse carries 22 stone and several men in each squadron carry large pioneer tools, spade, pick, and all those sort of things. They go out early in the morning, and come in late at night during manoeuvres, and the next morning they come out fresh, and go on all day again. They happen to be very hardy horses. I do not mean to say that the English cavalry horses could not do it at all. Our cavalry horses do not, in marching order, carry more than 18 stone, and you may take the men at 11 to 12 stone. I do not think when they went to Egypt the weight even was so heavy as 18 stone. We are nothing like as heavy as most foreign cavalry, though we should all like to reduce the weight. With regard to the saddle-tree invented by Mr. Wilhelmy, of Vienna, made up for me with the jointed side bars by Messrs. Wilkinson, it is not the least like the Danish tree, or at all on the same principle. I did not think of sending it to England till I found 500 Officers had bought it themselves to take to Galicia, at a time when war appeared imminent. I thought there must be something good in it then. The Austrian cavalry tried it severely in one or two regiments, with horses given to sore backs, and just before I came away, in 1890, a considerable number more saddles were ordered by the Government. I have one here which has gone through every description of experience; amongst others, it found its way once to Woolwich Museum of Curiosities, having been lost during its practical trial in this country. It went through a round of trial; it has been ridden in by very heavy men, by Scots Greys, Life Guardsmen, as well as by Hussars, for the last three or four years, and has answered very well. There is another saddle that has been in the Exhibition, which Colonel Brocklehurst, of the

Blues, has been building and using, also without a flap. The principle of the saddle is that if the horse is hollow-backed, and the man sinks down, instead of having to stuff the pannels, as they used to, or folding the blanket over, so as to raise the saddle at the back, he slips in a pad of felt, and raises the man ; or if the horse is very low in front, he puts the pad in under the front, so that it fits the man to the saddle. This has answered very well ; the men like riding on a blanket much better than on the flaps ; it gives them a much firmer, closer seat. We have also here a tree which has been made by an Officer of the 14th Hussars for a special horse, which he could not fit in any other way, and I believe it has answered admirably. It has had very broad side bars. With regard to carrying the carbine on the body or not is a question that affects the saddle, because it upsets the balance at present of the saddle so terribly ; anybody who has travelled much with muleteers and drivers of pack-animals knows that they add great stones to one side rather than have the balance wrong. We put the weight of the carbine all on one side, and then we expect the horse not to get a sore back. I always have been an advocate for the cavalry soldier having some arm on him. It would be a terrible thing if he was to get down and be left behind as he is at present equipped, without a sword or a carbine, or even his water-bottle. I have never seen any foreign cavalry who minded carrying the carbine across the back. The Adeu Troop, a magnificent body of cavalry, used to carry the carbine on the body, with the muzzle down, resting, when they wished it to do so, in a small bucket on the saddle ; the men did not have to pass the sling over the head to shoot : they could put it up to the shoulder, and could fire at once. I was particularly struck by it, and I have been trying ever since I saw it to get something of the kind, because after that terrible disaster which happened in Afghanistan to the 9th Lancers, owing to the carbine being on the saddles, I thought it was absolutely necessary that the men should have a firearm on their bodies in future. I am very glad to see the great interest that has been taken in this subject, and I hope the "Saddlery Exhibition," for which we are indebted so much to the Saddlers' Company, will make people pay more attention to the question of cavalry saddles. Oliver Cromwell, the finest cavalry soldier we ever had,

"perhaps the finest the world ever saw," as he is described by a celebrated German military writer, said : "Let the saddler see to the horse gear. I hear many are ill served. If a man has not good weapons, horse, and harness, he is as nought." That is absolutely true now as it was then. I will now ask Colonel Crichton to reply to various questions that have been raised, if he should wish to do so.

Colonel CRICHTON : I have not been asked many questions, but I should like to say one or two things. I am very sorry we are not able to have the foreign saddles themselves here instead of only my pictures of them ; but I asked the Clerk of Saddlers' Hall if he would allow us to have the saddles. He said he could not do so, because it would be a breach of faith with those Governments from whom the saddles were received. I was glad to hear Major Philpotts allow that the blanket slips were next to the horse's back. I always considered such was the case, Colonel Wood spoke about the horse-hair numdah of the American saddle. There was none in the Exhibition with that saddle ; there was only the blanket that I could see. Colonel Hutton says, that the numdah becomes unserviceable. I know it does become unserviceable in time ; it gets hard and then gets holes in it. That is the reason why I advocate the reversible numdah so strongly. It will last four times as long as the ordinary numdah, because there are four ways of wearing it. Then with regard to carrying the carbine, I am an advocate for carrying the carbine on the body, but I think General Fraser's way of carrying it, partly on the man and partly on the saddle, is much better than carrying it altogether on the man. I tried it this year on this principle, carried over the man's shoulder by a strap, and the muzzle in a little bucket. When the man dismounted, the carbine of its own accord came out of the little bucket and dismounted with the man in a very neat way. When the man mounted with the carbine hanging on the back he had to guide the carbine across the horse's back and then deposit it in the bucket. With regard to the injuries on the back of horse in the book of "Saddles and Sore Backs," by Veterinary-Captain Smith, I know perfectly well that such injuries, caused by the particular iron arched saddle there shown, have existed, and the only reason why I drew attention to them was that I wanted to show that it was

the fault of the saddle itself and not the fault of the Officers, because it gives the impression that Regimental Officers do not pay proper attention to their work, and that it was from this cause that all these sores came on the horse's back. The saddle which caused them, I am happy to hear now, will no longer be in the Service. With regard to the points on the saddles, Veterinary-Captain Smith told us some saddles had points behind as well as points in front, and the reason given was to prevent the saddle turning when mounting. That I always heard was the reason, but I never could think it was a good one. Certainly, anyone who has seen the cowboys drag themselves up from under the horse into the saddle would think their saddle ought to have points, but it has none. I do not think there is any necessity for these points, if that is the only reason that can be adduced for retaining them. With regard to what Major Horton said as to leather and felt for numdahs, I confess I think he was right about the felt being better than leather. I found that leather numdahs were excellent, but when they were subject to rough work the leather cracked, and therefore was no good. It is all very well for a gentleman's private stable, where it can be kept in good order and is not subjected to different climates, but it did not stand rough cavalry work. But with regard to the reversible felt numdah, I am perfectly certain that the reversible numdah is the right principle, and will last four times as long as the ordinary numdah. I will read a letter that I have had from Colonel Maberley, of the Scots Greys, on the subject of this equipment, in which he says: "I am sorry to say all your saddles were taken away from us at Brighton shortly before we marched for Ireland. As you may remember, I had the whole of my troop fitted with these saddles and marched from Edinburgh to Aldershot with them, had two seasons at Aldershot, and thence to Brighton, by which time I had almost ceased to think of sore backs or girth galls: it was quite the best saddle for the purpose I have yet seen. The numdah being fastened behind as well as in front kept the rug in its place and the backbone cool; the horses did not sweat so much, and cooled sooner after work. I only wish I had them in use throughout my regiment at the present time." With regard to my saddle and the tree being the same as the regulation saddle, it is very nearly the same as the regulation

saddle, but there are one or two little differences. I followed the regulation pattern as nearly as I possibly could, because I got them cheaper from having them the same pattern; but, at the same time, I should be very glad to go back to the wooden saddle-tree. I thank you for the kind way in which you have attended to what, I am afraid, has been a rather dry and uninteresting lecture. The good attendance, however, and the interest taken in the lecture, show that there is a very great deal of interest taken in saddlery at the present day by Officers of the cavalry, both past and present.

Colonel Wood: It seems to me, as all these saddles are in the country, that it would be a thousand pities if they were allowed to go out of the country. I think that we, as an Institution ought, to acquire those saddles, by hook or by crook, so that they may be kept for the inspection of Officers who wish to study the subject. Would it be possible for this meeting to express some wish of that kind?

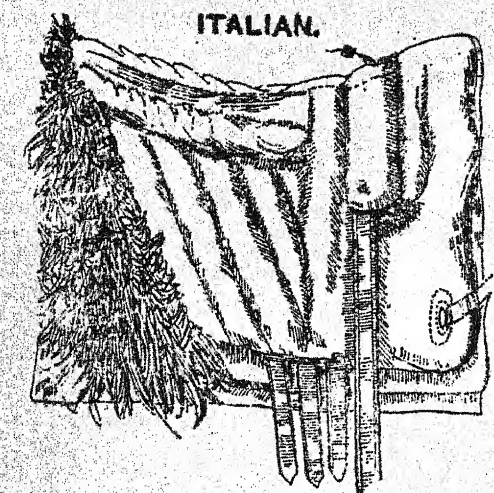
The CHAIRMAN: I also think it would be a great advantage if we could obtain them. I believe the Saddlers' Company got them through the Foreign Office, and I do not know whether they can be purchased.

Colonel Wood: May I propose to the meeting: "That this Institution is of opinion that it is most desirable to obtain the saddles, if possible, and that steps should be taken for the purpose."

Colonel BAYLISS: I shall be happy to second that.

The CHAIRMAN: I think we may say that that will be carried unanimously. I understand that it is the unanimous wish of this meeting that the saddles should be kept, and that the War Office should be asked that, if possible, they may be retained in England.

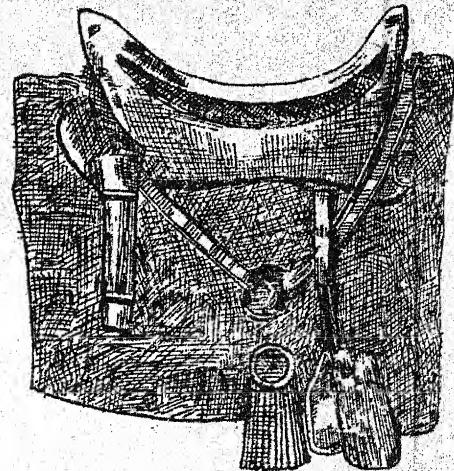
ITALIAN.



UNITED STATES AMERICA.



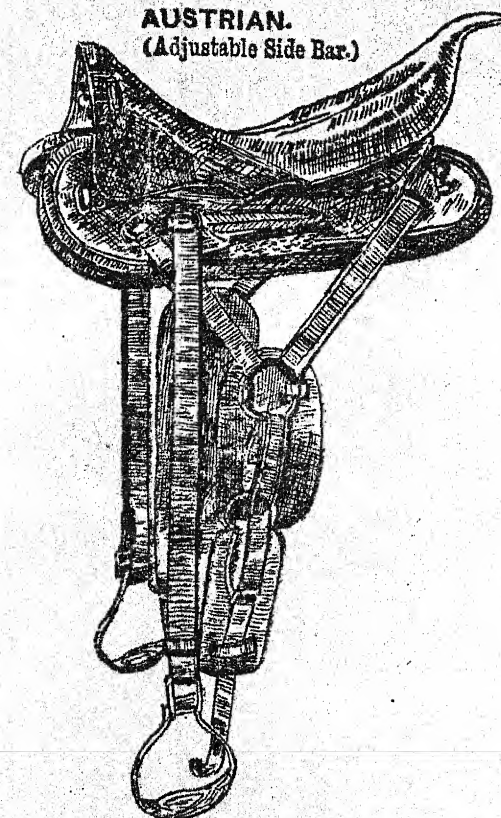
UNITED STATES AMERICA



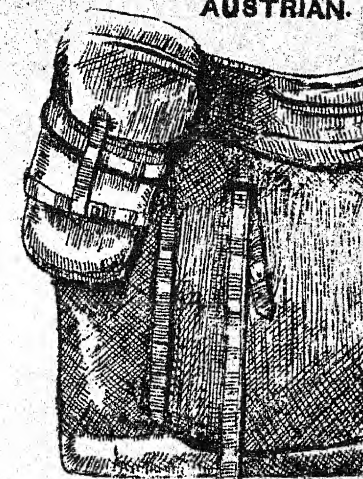
DUTCH.



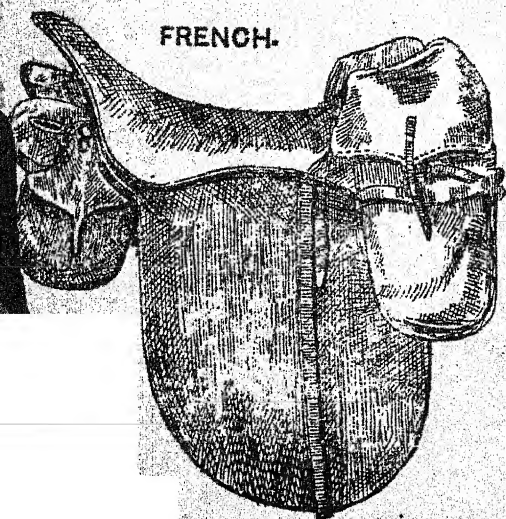
AUSTRIAN.
(Adjustable Side Bar.)



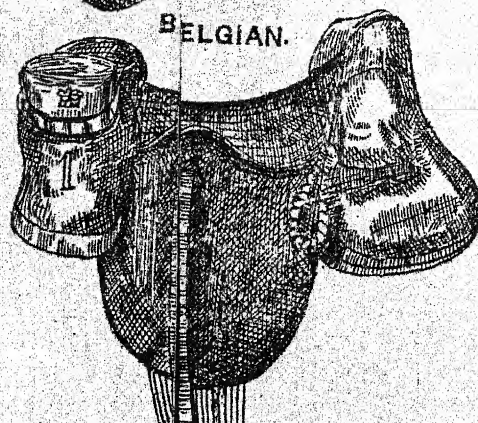
AUSTRIAN.



FRENCH.



BELGIAN.



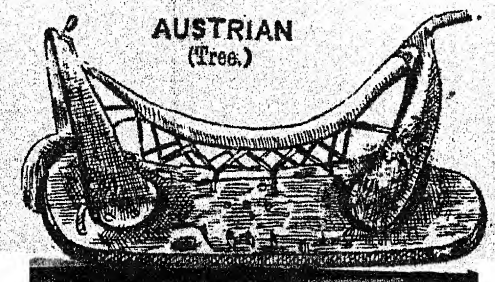
MAJOR BROCKLEHURST
(Royal Horse Guards.)



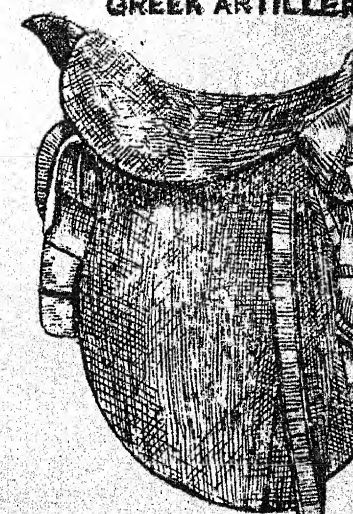
DANISH CAVALRY.



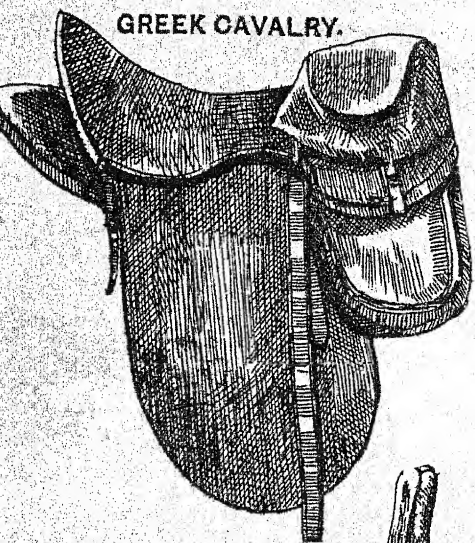
AUSTRIAN
(Tree.)



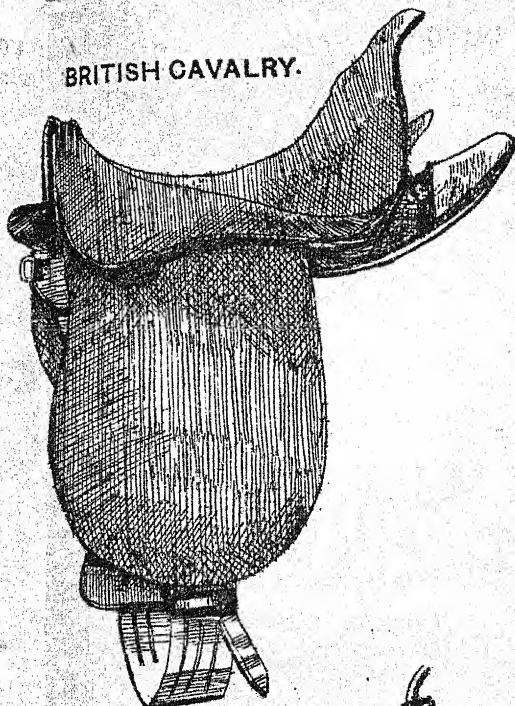
GREEK ARTILLERY



GREEK CAVALRY.



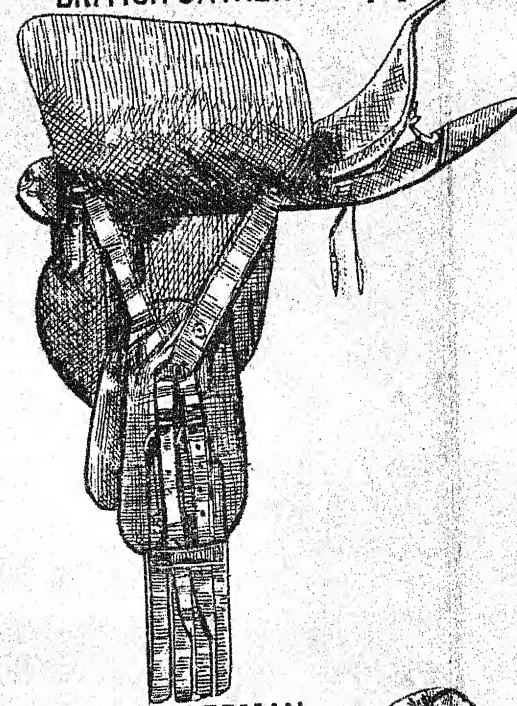
BRITISH CAVALRY.



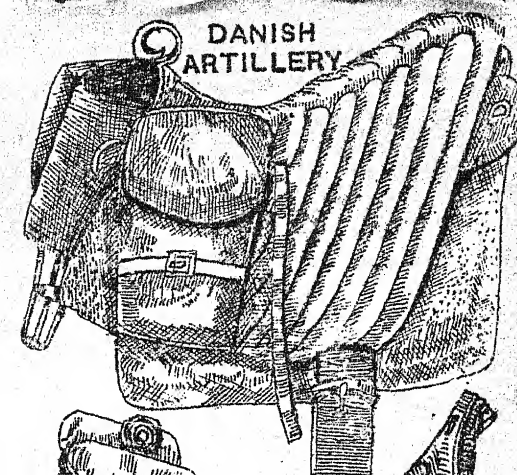
RUSSIAN.



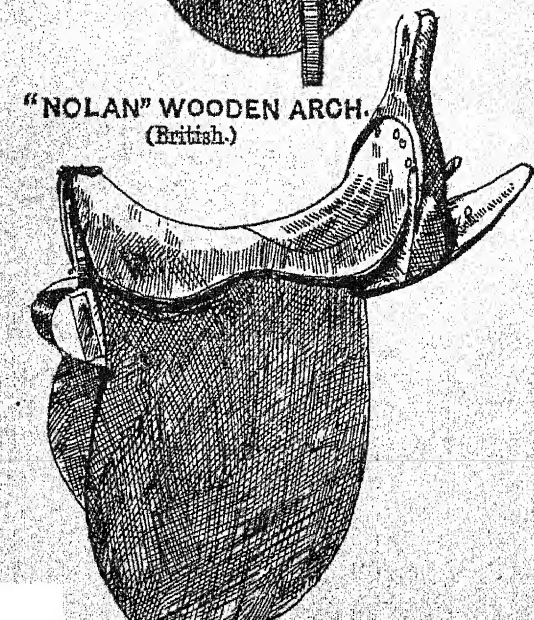
BRITISH CAVALRY. (Flap up)



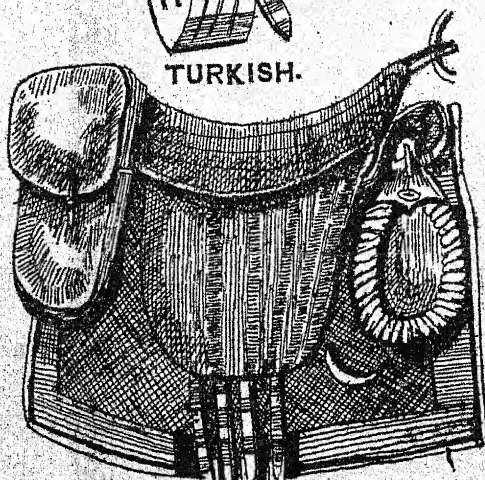
DANISH ARTILLERY.



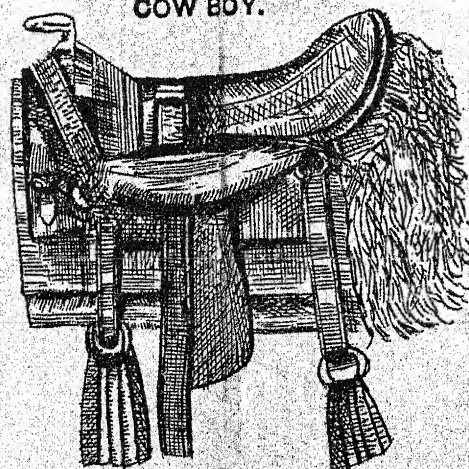
"NOLAN" WOODEN ARCH.
(British.)



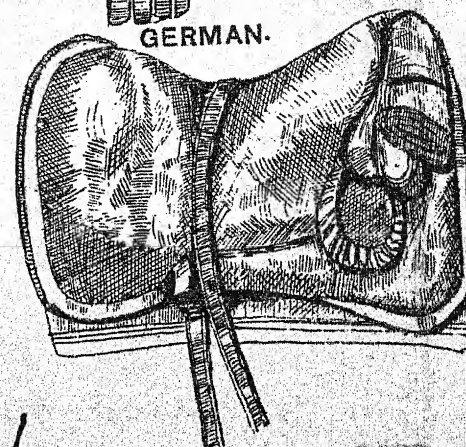
TURKISH.



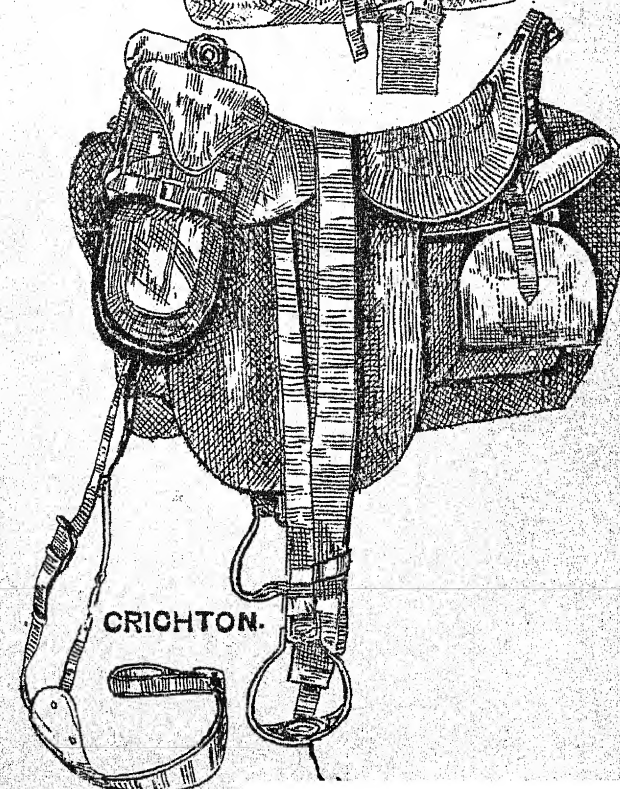
COW BOY.



GERMAN.



CRICHTON.



WEIGHT OF EQUIPMENT.

94. All the various changes and improvements in equipment have been made chiefly with the view of reducing the weight a horse has to carry on service. British Cavalry regiments mounted on walers undoubtedly have horses that can carry weight, but country-bred horses up to the present available for native cavalry have neither the stamina nor bone to do so, and hence the necessity for reducing every ounce of weight with due regard to efficiency.

The following statement submitted by the Officer Commanding 9th Bengal Lancers, to the Adjutant-General in India in May 1894, shows that the average weight of a sowar in that regiment was 18st. 13lbs. in "heavy marching order" and 17st. 4lbs. in "light marching order." No doubt some regiments have reduced this considerably. I think, however, we may safely say that the average native cavalry sowar rides 18 stone in "heavy marching order" and 17 stone in "light marching order." These figures should be borne in mind by officers on remount duty:—

Average Weight of Regiment.

				st. lbs.	Average weight per man, 9st. 5lbs.
Right Half A squadron (Sikhs)			..	9 11	
Left " A " (")			..	9 7	
Right " B " (")			..	9 4	
Left " B " (Dogras)			..	8 5	
Right " C " (Punjabi-Mahomedans)			9	7	
Left " C " (Tiwanas)			..	9 11	
Right " D " (Pathans)			..	9 5	
Left " D " (Hazaras)			..	9 8	
Total				.. 75 2	

A MAN'S KIT, ARMS AND AMMUNITION, WITH WEIGHT IN
HEAVY MARCHING ORDER.

Kit.

1 loongie.				
1 coat, khaki.				
1 pair breeches.				
1 turban.				
1 waistcoat.				
1 pair ammunition boots.				
1 " putties				
1 " gaiters.				
1 " spurs.				
1 havresack containing	{ Horse-brush, hoof- picker and curry- comb. 1½ seers food for rider.	st.	lbs.	
		2	13	
1 water-bottle containing 1 seer water.				
1 belt, with slings and pouches.				
1 pair shoulder-chains.				

Arms and Ammunition.

Carbine	...	...	...	7	lbs.
Ammunition, 40 rounds	...	...	...	4	"
Sword	...	...	...	3	"
Lance	...	...	...	4	"

HORSE FURNITURE, WITH WEIGHT IN HEAVY MARCHING
ORDER.

1 saddle, with wallets, stirrups, &c. (26lbs.)			
1 regulation bit and bridle (5lbs.).			
1 leading-rope.			
1 shoe-case, with 2 shoes and nails.			
1 carbine bucket.		st.	lbs.
2 iron pegs for picketing.		6	9
1 great-coat and cape.			
1 nose-bag containing 1½ seers grain.			
1 heel-rope.			
1 canteen set.			

2 forage nets, containing 3 seers grass.
 1 black blanket (7lbs.).
 1 khaki " (5lbs.).
 1 chagul, containing 3 seers of water.

N.B.—Wallets contain change of clothes.

ARTICLES THAT COULD BE REDUCED IN LIGHT MARCHING ORDER.

Horse-brush, hoof-picker and currycomb,	1 lb. 5 oz.		
Change of clothing, per man	... 2 lbs. 1 "	st.	lbs.
Forage nets ...	... 8 " 8 "	1	9
Khaki blanket ...	... 5 "		
Chagul ...	... 6 "		

From the above calculations we see that the horse of an average sowar of the 9th Bengal Lancers carries in—

Heavy marching order	Sowar's weight, 9 st. 5 lbs.		st.	lbs.
	" kit,	2 " 13 "	18	13
	Horse furniture 6 " 9 "			
Light marching order.	Sowar's weight ... 9 " 5 "		st.	lbs.
	" kit	... 7 " 13 "	17	4
	Horse furniture }			

SECTION IX.

PURCHASE OF REMOUNTS.

95. Remount duty is one of the most interesting as well as responsible that the Native Cavalry Officer has to perform. Most men fancy themselves, more or less, as judges of horseflesh, but luckily they do not all agree about a horse, or the competition at Fairs would bring about prohibitive prices. When an officer is ordered on remount duty the first thing for him to do is to try and get a good *dalal*, who is a judge of a horse, and to keep him throughout the season. If he does well, tell him he will be made the Regimental

dalal. He will save the regiment more than 2 rupees per horse (the usual fee) in men's shoe leather alone.

In most regiments one or two British Officers generally buy all the remounts. In others this important duty is entrusted to Native Officers. I regret to say I have little faith in detailing Native Officers to purchase horses, after what I have seen. With few exceptions they shirk responsibility, lose a great many opportunities by not being able to make up their minds, and generally end by including doubtful horses in their purchases. In short, they cannot use their discretion. As assistants to British Officers they are invaluable.

Now as regards the remount party. The non-commissioned officers and men generally selected are seldom the best judges of horseflesh in the regiment, but oftener the dismounted men. Every Officer who has purchased at a Fair knows the value of having his party spread out in all directions to intercept likely horses coming into the Fair. Yet often these men, being ignorant of the points of a horse, are of no assistance, and waste their time in stopping and bringing up useless brutes. Squadron commanders should therefore keep a roll of men fit for remount duty, from which remount parties should be selected.

The secret of buying horses at a Fair, is to work very hard before and after its first commencement, so as to start well, *i.e.*, with a good number of 4-year olds as cheap as possible. Then to take your time and pick up horses by ones and twos daily. Mark down all the horses you like but cannot afford to buy, and wait till the very end of the Fair before you give up hope of getting them. You will generally find that the owners

of many of these horses will come down in their prices rather than have the horses left on their hands (especially at the Spring Fairs); or, having begun well, you may find you can afford to pay higher prices for the remainder.

If, by any chance, you fail to get horses owing to there being a very large number of purchasers who also stay on late at the Fair (my experience is that very few do), you can generally rely on getting the numbers you require from Mohammed Afzal Khan, the Lahore Horse dealer, who always has a large number for sale at both the Amritsar Fairs. You will, moreover, be able to get some 4-year olds from him, which is a great help sometimes when you cannot get the ones you want in the Fair.

There is a strong feeling against Mohammed Afzal Khan; but I confess I don't think he interferes much with the purchase of Native Cavalry Officers in the open market; whereas if war broke out he would be of very great assistance to Government.

There is absolutely no doubt that 4-year old horses cannot be obtained in sufficient numbers; the question then arises—how many three-year olds should be purchased annually in order to keep regiments efficient? The answer is arrived at by calculating (approximately, of course,) at the beginning of each year the number of horses required so as to ensure the regiment being able to proceed on service 500 strong at any time. In order to do this due regard must be paid to—

- (1) The number of young and unbroken horses in the regiment.

(2) The probable number of casters during the year.

(3) Probable number of weak and sick horses unfit to take on service.

Some regiments disregard the above and buy 2 and 3 yearolds indiscriminately and put them into paddocks. No doubt they are more or less obliged to do this, and the system is an excellent one, for the freedom and feeding up that the young stock get make them develop into grand horses ; but a line must be drawn as to the number. I fail to see how regiments can be kept " fit for service " if they do not moderate their purchases of young stock in accordance with the above scale and husband the resources of their Chanda Funds so as to give an average of Rs.275 per horse.

As regards the actual selection of horses, few Officers go to Fairs who have not had some experience of horse buying, but the prices they pay for horses depends much more on their exertions than on good luck ; although the latter, like in everything else in this life, is an important factor. Remounts, therefore, should not only be judged by their looks, but by their cost ; although, it is bad economy to buy a horse only because he is cheap and will reduce the average price. It is the number of these " average " horses that ruin the mounting of many native cavalry regiments. The temptation at a Fair to buy a " thorough-bred but light horse " is very great, and requires a deal of moral courage to avoid sometimes. The first question, therefore, to ask yourself when looking at a horse is, " Can he carry 18 stone ? " If doubtful, leave him alone. A good rein, good ribs, and good action are indispensable also.

Most commanding officers of native cavalry regiments now give strict orders that no horses under 14-3 are to be bought, irrespective of age ; the consequence is that a large number of nice horses with good bone below that height can be procured at a moderate figure. These horses come in very useful for Imperial Service Cavalry and can be procured at an average of about Rs.230, which is all the Phulkian States can afford to pay. So that the interests of Native Cavalry and Imperial Service Cavalry do not clash.

A List of the principal Horse Fairs in India with approximate dates of holding them annually is given on page 321.

PURCHASE OF MULES.

96. Most regiments now have mule transport, and the mule market has also many other drains on it ; the consequence is that the prices have gone up tremendously. Some Native Officers can, I think, be trusted to buy mules, and often make excellent purchases at moderate prices. I strongly advise a separate *dalal* for mule buying, and one who is not only a good judge of a mule, but is a man of influence ; because at Fairs now mule *dalals* combine and practically rule the prices. Mules, however, can be procured at moderate prices if the method I have recommended for purchasing horses is adopted, although it is easier now to buy cheap horses than cheap mules. A batch (10 or more) of good mules 4 years old and over, and not less than 12-3 in height, should not average more than Rs.140.

As regards make and shape, the nearer a mule approaches the shape of a horse the more valuable are the qualities united in him. It may, however, be as well to summarize the points of a good mule :—

Minimum height.—Twelve hands one inch.

Girth.—A good girth means depth and breadth of the chest cavity, and gives promise of strong, vigorous lung and heart.

Shape of the back.—The shape of the back is also an important point. A long or hollow back is a weak formation. A slightly arched back denotes strength of that part, but is too often accompanied by long legs, flat side and drooping quarters. A “roach” back is no disadvantage if you have an ordnance saddle which divides over the back and does not touch the spine. With the ordinary native saddle a roach back is, from its very formation, constantly liable to galls.

High withers.—Are a very bad fault, as they are liable to gall ; and a croup higher than the withers is objectionable, as with this formation the load is unduly forced forwards and the withers may be injured.

We now come to the combination of those excellent points :—

Barrel.—Round.

Loins.—Broad and muscular.

Ribs.—Deep back ribs. Short space between the last rib and the hip-bone.

If you can purchase a mule with all the above points well developed you will have an animal who can thrive on a diet of brickbats and water !

The following are some of the principal Horse Fairs in India with approximate dates of holding them annually :—

Province.	Horse Fairs and Shows.	Dates.	AMOUNT OF PRIZES TO BE AWARDED TO HORSES					Route by which the Fair or Show is reached.	REMARKS.
			From Imperial Funds.	From Provincial Funds.	From Local and District Funds.	From Private Subscriptions.	Total.		
			Rs.	Rs.	Rs.	Rs.	Rs.		
Baluchistan ...	Quetta Horse Show ...	13th to 15th September ...	1,000	...	...	...	1,000	Rail.	
Punjab ...	Amritsar (Dewali) Fair ...	8th to 17th November ...	300	...	...	...	300	Rail.	
Rajputana ...	Pokhur Horse and Cattle Fair	24th to 28th „ ...	(Particulars not available.)					Rail to Ajmere, thence 7 miles by road.	
N.-W. Provinces...	Batesar do. do.	25th November to 4th December.	...	...	...	...	...	Rail to Shekoabad, thence 13 miles by road.	Bathing day, 28th November.
Baluchistan ...	Sibi Horse Show ...	20th February and following days.	1,400	...	1,750	...	3,150	Rail.	
Punjab ...	Jhelum do. ...	24th and 25th February ...	550	...	700	...	1,250	Rail.	
Do. ...	Multan do. ...	6th and 7th March ...	1,200	...	300	...	1,500	Rail.	
N.-W. Provinces...	Bulandshahr Horse Show ...	6th to 11th March ...	1,200	...	...	...	1,200	Rail to Chola, thence 10 miles by road.	
Punjab ...	Dera-Ghazi-Khan do. ...	9th to 11th „ ...	1,800	...	...	...	1,800	Rail to Ghazi Ghat, thence 11 miles by road.	
Do. ...	Shahpur Horse Show ...	20th to 22nd „ ...	1,350	...	...	...	1,350	Rail to Khushab, thence 10 miles by road.	
Do. ...	Lahore do. ...	24th and 25th „ ...	900	...	...	...	900	Rail, 3½ miles to Shalimar Gardens.	
Do. ...	Gujrat do. ...	27th and 28th „ ...	1,100	...	...	...	1,100	Rail.	
Do. ...	Rawalpindi do. ...	3rd to 5th April ...	1,950	...	400	...	2,350	Rail.	
Do. ...	Amritsar (Bysakhi) Fair ...	6th to 15th April ...	...	...	...	...	...	Rail.	



SECTION X.

INSPECTION OF HORSES.

98. The efficiency of a regiment depends so much on the horses in it that the commanding officer should be a good horse-master. It is impossible to teach him to become a good judge of a horse, as this has to be born in a man ; but there is no reason why he should not know a bad horse, *i.e.*, one unsuitable for his regiment, and moreover study the best system of stable management so as to have all his horses kept healthy and fit for service.

It is not sufficient for a regiment to have its horses fat and sleek ; they must also be hard at the beginning of the drill season. Sufficient attention is not paid to this very important point, and instead of horses being gradually trained to the extra work in store for them, they are often suddenly put to it with the inevitable consequence that a great many suffer and some are permanently injured. A careful study of this subject ably treated by Veterinary-Colonel Poyser, *vide* page 394, should be made, so that when the regiment actually goes on service all ranks will have learnt how to nurse their horses and the casualties from preventable causes (*vide* Veterinary-Captain F. Smith's excellent article on the "Loss of Horses in War," page 593,) will be as few as possible.

Nothing is so wearying for horses as long hours at drill without a dismount, yet often one sees an officer commence a parade and work for a whole hour without allowing the horses to stale or easing them in any way. Needless to say this is another important point to be attended to.

British and Native Officers are now expected to know the age, history, and characteristics of all the horses in their squadron. They are expected to go frequently to the Horse Hospital to learn the state of the sick horses, and when opportunity occurs to riding-school, to see how the young horses are getting on.

The following are some of the advantages due to this reform:—

- (a) Officers take more interest in their horses.
- (b) Horses are better cared for, and therefore last longer.
- (c) Horses with peculiarities are made allowances for and therefore do not get ill-treated, but often cured of bad habits by proper methods.
- (d) Horses are employed to best advantage through the knowledge of their special capacities for various duties, *e.g.* :—
 - (1) As a steady charger.
 - (2) Long reconnaissance work.
 - (3) Crossing rivers.
 - (4) Tent-pegging, post practices, etc.

(5) Jumping.

(6) Orderly duty.

(c) Horses are more handled and therefore less timid.

An inspection of horses should be held by the commanding officer on the first of every month at muster as a standing rule, and oftener if necessary. It should be held some distance away from the lines as follows :—

Horses to be drawn up in column of squadrons. Interval between horses, one horse's length. Distance between front and rear rank, two horses' lengths. Distance between squadrons, three horses' lengths.

Last shod horses on the inner flank of their respective squadrons to be turned in when the squadrons file by.

Farriers to be on parade with their tools ready to remove any shoes.

Remounts and horses next for casting to be formed up in rear of the regiment by squadrons.

Regimental horse-roll should be produced at this inspection.

Horses should then file past, at one horse's length distance, between the commanding officer and section commanders, who should stand facing the commanding officer about 20 yards off, while the horses of their

sections are passing. Squadron and half-squadron commanders should stand on the right of the commanding officer.

This parade should invariably be in uniform (as for stables) except during the hot weather, for if held in mufti like in some regiments the men do not realise the importance of it. The horses should be rugged (saddle cloths of neat pattern will answer the purpose) and on special occasions the horses might wear their parade headstalls and bridoons, but on ordinary occasions only watering bridles well cleaned up.

Squadron commanders should be very particular to see that every man knows how to stand to, lead, and show his horse in the orthodox manner. In native regiments these movements are seldom smartly done and one often sees horses being led with their heads down, looking as if they had headaches or were ashamed of themselves!

Horses must be absolutely clean all over specially forehead, forelock, mane, between forearms, thighs, hocks, roots of the tail and heels. Hoof ointment should be applied.

Manes should never be hogged or cut, they should be pulled the length of the span of the hand parallel with the crest on the near side (officers' chargers on the off side) and tails should not be cut shorter than 6 inches from point of hock. Both manes and tails should be so carefully brushed and dressed daily the whole year round that they look polished.

As the horses file past, the commanding officer should question the officers and section commanders about

their shape, capabilities, temper, etc., and in case of those out of condition or with bad coats, what steps have been taken regarding diet, etc. He will thus find out who the best horse-masters in his regiment are, and will get a far better idea of the grooming, condition and shoeing of the horses than by walking round the lines always and seeing them on their standings.

Occasionally the inspection of horses should be combined with a parade in service marching order and for fitting of saddle trees, *e.g.*, in each squadron No. 1 troop might parade in service marching order and No. 3 troop with stripped saddles for fitting trees. The commanding officer should examine the officers in packing kits; and in the fitting of saddle-trees and saddles in detail, according to "Saddling of Cavalry Horses" by Lieutenant-General Sir F. Fitz-Wygram, *vide* page 351.

Similar parades should be held by squadron commanders from time to time.

INSPECTION OF BAGGAGE ANIMALS.

99. The great pride of Native Cavalry is its mobility, being able to move off at shorter notice than any other branch of the service. This mobility depends on the efficiency of its baggage animals which should be only mules if possible. Squadron commanders are solely responsible for their care to the commanding officer, but the latter should satisfy himself by personal inspection periodically, that the animals are in good condition, sound, and up to the work likely to be required of them on service. This inspection might with advantage be held conjointly with the inspection of horses on the first of every month, as under.

Baggage animals to be formed up in column of squadrons 50 yards from the outer flank of the horses. One troop (to be nominated by the commanding officer) of each squadron to parade with gear complete, the fitting of which should be scrutinized.

The animals must be thoroughly groomed and as clean as the horses. Their manes should be hogged and tails cut. Every animal must have a proper watering bridle and not a piece of string attached to a native bit, which is a source of great cruelty to this worthy dumb animal.

When the animals are ordered to file by (which should be at the trot occasionally) the officers and section commanders will take up the same positions as for the inspection of horses and will be similarly questioned by the commanding officer regarding the qualifications and welfare of their baggage animals, and the best methods of loading them for field service.

Similar parades should be held by the squadron commanders from time to time.

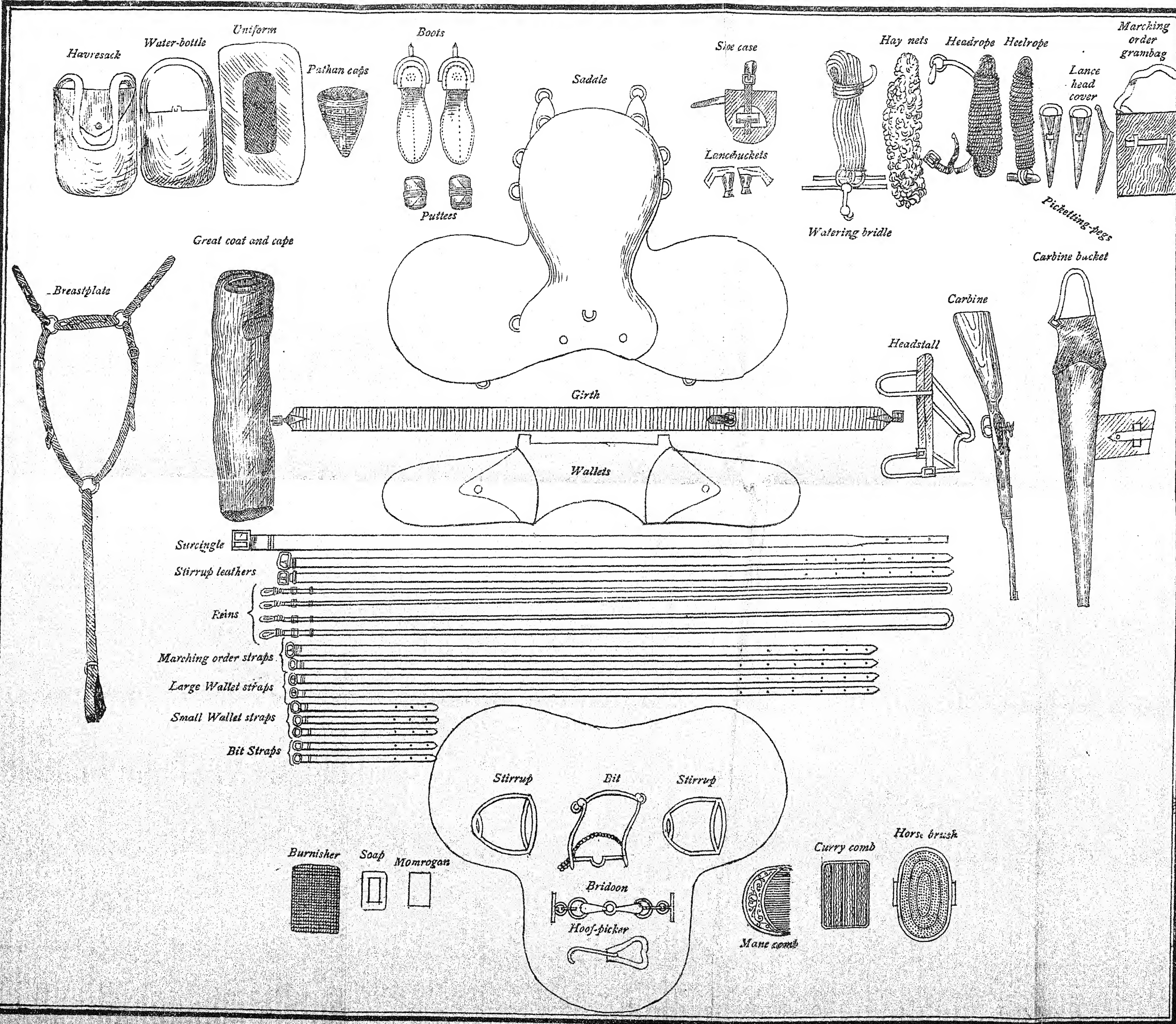
SADDLE AND KIT INSPECTION.

100. A saddle and kit inspection should be held weekly by squadron commanders and once a month by the commanding officer as follows :—

1st Squadron	...	Saddlery and kits.
2nd	„	... Cloaks.
3rd	„	... Arms.
4th	„	... { Jhools and stable gear. Horses to be jhooled up and bedded down.

SADDLE AND KIT INSPECTION DIAGRAM.

THE SOWAR SHOULD STAND HERE.





The above squadrons should be named by the commanding officer shortly before the hour appointed for the parade which will ensure their all being thoroughly prepared. If preferred, all the squadrons can be detailed for the same inspection or the parade varied in other ways.

Saddlery and kits will be laid out with the utmost precision and nicety on white sheets of similar dimensions 9 feet long and 6 feet broad, with blankets under them, according to the accompanying form. Uniform must be neatly folded. The saddle and all leather articles must be soft and polished, *vide* recipes given in the form below. All straps including girth attachments must be detached. All brass and iron must be well burnished and made to shine. Chaguls and water-bottles filled with water. Horse-shoes and nails fitted to horses.

RECIPES FOR MAKING

(1) *Blacking*.—For blacking and polishing boots and accoutrements :—

			lbs.	oz.
Ivory black	2 0
Molasses or treacle	2 2
Pale Southern Whale-oil	0 7
Vitriol	0 9
Vinegar, Malt, No. 18	1 2
Total			..	<hr/> 6 4 <hr/>

(2) *Momrogan*.—For cleaning and polishing brown boots and accoutrements:—

			lbs.	oz.
Bees'-wax	..	..	1	0
Vaseline tallow	..	..	1	0
Mutton "	..	..	3	0
Camphor	..	..	0	2
Spirits of turpentine	..	..	1	pint.

(3) *Dubbing*.—For greasing boots that have been wetted or that have to be stored:—

Proportions of tallow and fish-oil, boiled and stirred till cool. In a cold climate the proportions of these two ingredients should be about equal, but in a warm climate the proportions should be $2\frac{1}{2}$ of tallow to $1\frac{1}{2}$ of fish-oil.

The squadron should parade with their cloaks on, which should be long enough to reach within 8 inches of the ground, complete with buttons of Regimental pattern, and all stains and creases removed.

The squadron should fall in in drill order with lance, sword, and carbine. A careful inspection of the turn-out of the men should first be made and untidy uniform or accoutrements or any irregularity in tying the loongie, kamar-band, shoulder-chains, boot laces, etc., must be checked at once. Often sword-knots are deficient and spur-straps not properly fitted. Lances are sometimes too

heavy and often not properly balanced. The following rules therefore should be strictly adhered to:—

(1) The lance should be 9 feet in length from point of head to butt end.

(2) The lightest male bamboo of sufficient strength should be selected so that the lance may not weigh more than $3\frac{1}{2}$ to 4lbs.

(3) To begin with the head should be fixed on and the butt put in its place, but not secured till the lance has been balanced.

A sling 24 inches long should then be attached to the shaft by means of wire (or leather) lacing. Care being taken that the upper edge of the lacing is in line with the front point of a man's shoulder when he is mounted and has his lance at the "order."

(4) The lance should be balanced by "leading" the butt, if necessary. This is often a very difficult process with the regulation shaped butt, so that a perfect balance cannot always be obtained unless a larger sized butt is used.

Lance and sword points are sometimes rusty and carbines not as clean as they might be, and the stocks too dry.

In grounding lance, drawing and returning swords, porting and examining arms, a want of smartness is often observed. This requires special attention and practice.

Jhools frequently do not fit about the neck, leaving it exposed. The blanket should be put on at night so as to go round the neck, then the jhool should be strapped over it so as not to shift or irritate the horse, otherwise they will be no comfort to him in cold or wet weather.

Stable gear is often incomplete. Headstall does not fit and eyefringe is broken. Body-roller has no pad. Brush and currycomb have no straps. Head and heel-ropes too weak, etc.

The above inspections of course will be on foot, but it is advisable to vary them with mounted ones in marching order.

SECTION XI.

CAVALRY ARMAMENT.

101. The following extract from an article on the above subject by Lieutenant-Colonel P. Neville, 14th Bengal Lancers, that appeared in the Journal of the United Service Institution of India, is very interesting and instructive :—

“The question of the best armament for cavalry is one which has for centuries occupied the attention of military authorities in all the Great Powers of Europe, and, strange to say, it is a question which does not seem even yet to be definitely and satisfactorily settled. The principal point at issue is, putting minor points

aside, whether the lance or the sword is the better weapon, and, as a side issue, whether the front ranks should not be armed with the lance and the rear ranks with the sword. There seems to have been at various times epidemics, so to speak, of enthusiasm for one or the other arm. We see nations discarding the sword for the lance at one period of their history, and at another reverting to the sword and carbine.

"Germany at present favours the lance, and in India during the past quarter century, a number of Native Cavalry regiments have discarded their national *tulwar* for a lancer armament.

"No living writer has gone more thoroughly into this subject, or brought a greater battery of erudition to bear upon it, than Lieutenant-Colonel Elliot, commanding the 3rd Bengal Cavalry; and in this short paper (for I have no intention, even if I had the ability, of dealing exhaustively with so wide a subject), I shall make frequent quotations from his pamphlet published in 1890, and entitled 'Notes on Cavalry Literature, treating more especially of its armament.'

"Colonel Elliot's conclusion is that the lance is the more suitable weapon for the shock, and the sword for the subsequent *mêlée*.

"In this most cavalrymen will agree, but here we are but at the commencement of the problem, which really is, how the same man may be enabled to first attack with the lance and immediately afterwards employ the sword as his weapon. Going back to the Middle Ages, we find the heavy-armoured knights charging in line,

armed with very long and heavy lances. They were followed at some 40 or 50 paces by a second line composed of their esquires and men-at-arms who carried swords. If the charge was successful, this second line, joining in the *mêlée*, helped to complete the victory; if, on the other hand, the knights suffered a reverse, they were enabled to rally and re-form behind this second line. It will be remarked also by the student of history that, after the first shock, the knights discarded the heavy lance and laid about them stoutly with mace, battle-axe, or sword.

"Before considering the three-fold question, *i.e.*, lance in both ranks, sword in both ranks, or lance in front and sword in rear ranks, I will give some quotations from Colonel Elliot's book to show the various opinions of recognised authorities on the subject; and by authorities I mean not only writers who have devoted time and study to the subject, but also, and more especially, men who have been expert leaders of large bodies of cavalry in the field, and whose *dicta* are based on actual experience in war.

"In 1811, Napoleon, by a decree, dated the 11th November of that year, attached a regiment of lancers to each division of cuirassiers, thus recognising the principle that the lance is useful in the front rank only.

"In '*Les Tendances actuelles de la Cavalerie Russe*' by Sainte Chapelle, Paris, 1886, a full account of the recent transformation of the Russian cavalry is given, from which it appears that by a Ministerial decision, dated April 1883, the regiments of Don Cossacks have preserved the lance, but in the front rank only. The commission

charged with the enquiry on this subject give the following reasons in support of their decision :—If the horse-men of both ranks have the lance, the result in a charge will be as follows:—At the moment of impact, either the front rank man will strike his adversary and leave the lance in his body, or if he has missed, it will be because the latter has taken off the point of his weapon with his sword. In either case the lancer will find himself unarmed in the *mêlée* ; and, *a fortiori*, the rear rank man, who charges with his lance carried and disengaged from the boat, will be disarmed also ; whilst if the front rank only have the lance, the rear rank man, charging sword in hand, will be able to come up to the support of their front rank men.”

An article entitled “*Les Transformations de la Cavalerie*” in the *Revue de Cavalerie*, 1886, gives a full account of lancers and their suppression in the French and Austrian armies. The writer is an enthusiast for the lance. In 1870, towards the end of the Franco-Prussian war, the Colonel of the 5th Lancers telegraphed to Paris for permission to discard his lances and use rifles instead, on the ground that he could not perform properly outpost duties in front of the army. General de Laverdo, of the Ministry of War, telegraphed in reply :—“*Prenez modèle, pour éclairer l’armée, sur les Uhlans Prussiens, qui sont armes de lances.*”

Marmont favoured the lance for the front rank only :—“*Il faudrait en armer le premier rang de tous les régiments de ligne et de grosse cavalerie.*”

Latour-Maubourg, at the battle of Dresden, 27th August, 1813, made repeated attacks on the Austrian squares ; but failed in them all, until he placed fifty

lancers of his personal escort in front of the cuirassiers. These lancers made a breach in several squares, through which the cuirassiers poured, and so broke the left wing of the Austrian army.

In an article, "Encore la Lance," in the *Revue de Cavalerie*, 1890, the writer says:—"In Germany up to the present time there were only 25 regiments, out of a total of 93, armed with the lance. Under recent orders issued by the Emperor, there are now 35 equipped with the new armament, and 39 if the four regiments of heavy Saxon and Bavarian cavalry are also to receive the lance." Quoting Lieutenant-Colonel Elias, of the English Army, he says: "Quoi qu'il en soit, l'opinion de ceux qui conseillent d'armer le premier rang de lances mérite d'être examinée. Pour nous, Anglais, qui avons si souvent à combattre contre des Afghans, des Arabes, et autres guerriers Asiatiques courageux, il est vrai, mais pourvus de mauvaises armes à feu, la lance serait d'une grande utilité, car ces ennemis se couchent à terre dans le mêlée et ils deviennent dangereux dans cette position où le cavalier ne pu et les atteindre avec son sabre."

The truth of this was proved very decidedly in the Afghan campaign of 1879-80. The enemy threw themselves down when charged by cavalry and slashed up with their heavy knives as the cavalry passed over them, inflicting in numerous cases mortal wounds on our men. Swordsmen were unable to reach them with their sabres, but our lancers gave such a good account of the enemy that they quickly learned to dread the lance, which is undoubtedly the "Queen of weapons" when employed against infantry.

"So far as native horsemen are concerned," writes Colonel Elliot, "it is absolutely necessary to eradicate from their minds the feeling that they are 'incapable of it.' They know (few better) the difference between a sharp *tulwar* and a blunt sword. They know from personal experience what the lance can do and what it cannot do. Some day these men may be called upon to face the fire of magazine rifles. To do this with any chance of success, they must feel and know that they have the best armament in the world, and not the second best only. Second best armament means second best troops, and as it costs no more to feed and pay the best than the second best troops, a wise policy would seem to be to consider these matters while it is day. . . . Asiatics have in all ages and in all countries supplied their want of physical strength (as compared with Europeans) by the very simple process of never using edged weapons, such as swords, knives, daggers, scimitars, etc., *unless they had a razor-like edge*, and with which, from their natural construction, they can inflict terrible wounds. The Hindustani *tulwar*, Mameluke sabre, Afghan knife, Malay creese, Ghooorka *kukri*, Turkish scimitar, Albanian *yataghan*, Persian sabre, Japanese sword, are all practical examples of the truth of the above statement. . . . Nolan quotes many instances which tend to show that irregulars armed with *sharp* swords, and having a proper command over their horses, have over and over again severely punished English dragoons of far greater physical strength and moral courage than themselves."

The above goes to prove that if cavalry are to be armed with the sword, the sword must be *sharp*, and

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not the blunt steel bar which is in vogue in our army to-day. This is of little use except to parry, unless when placed in the hands of a second Samson, who, it may be remarked, might do as good execution with his traditional jaw-bone of an ass.

Wellington was of opinion that the rear rank at close order was of no use to the front rank :—" I think that the second rank of cavalry at the usual distance of close order does not increase its activity. The rear rank does not strengthen the front rank, as the centre and rear ranks do the front rank of infantry. The rear rank of the cavalry can augment the activity, or even the means of attack, of the front rank, only by a *movement of disorder*." This tends to prove that our present system of charging with the rear rank at close order is vicious and unsound. If this be true for hussars, it is doubly so for lancers, for the rear rank lancer, charging at full speed *eight feet* in rear of his front rank man *with his lance at the "carry" in the bucket*, is not only practically helpless and useless at the moment of impact, but also he is a source of danger to his front rank man.* Jomini, Marmont, Roche-Aymon, Okounneff, all are in favour of the lance in the front rank only. Saxe, Poniatowski, Latour-Maubourg, De. Brack, Roginat, Gouvion St. Cry, Foy, Morand, Colbert, Pajol, and Napoleon recommend the use of the lance and swords

* A British Cavalry Officer who has served many years with both hussars and lancers, writes :—" I can assure you that when the charge sounds for a real conflict, the rear rank men bring their lances to the 'engage' also; not likely men are going into an enemy with their lances at the 'carry.' If they had swords it would do away with the above danger."

in conjunction, each weapon in its proper place; the one supplementing and correcting the defects of the other.

Sir Charles Napier looked on native horsemen as men of the sword, and was of opinion that their own national *tulwar* was for them the best weapon. He was dead against "dragooning" the irregular cavalry of India. He did all he could to ridicule the idea that Asiatic horsemen could be expected to become the counterpart or duplicate copy of English dragoons, but, as he says, in his letters, without the least success.

The events of 1857 swept away in one day the regular Native cavalry with their blunt swords, long stirrups, and slippery saddles, to be replaced by corps like those commanded by Probyn and Hodson, whose men, being left to choose their own horses, saddlery, weapons, etc., according to their native ideas of what was really suitable, very soon convinced all concerned before Delhi and Lucknow that the wisest policy is to recognise the fact that the irregular native horsemen has one way of fighting, and the European dragoon another.

These modes of fighting, utterly distinct, are well contrasted by Nolan.

"As Charles Napier said, the European trooper's downright blow splits the skull; the native sowar has, as a rule, neither the strength nor the nerve for this style of warfare; so he, with cunning artifice, instead of brute force, arrives at the same object by a delicate drawing cut (from the wrist) across a limb, which in nine cases out of ten severs some artery or blood-vessel. The result is the same, though the weapons employed are quite different."

Sir Charles Napier, writing on the subject, says :—
 “The slicing of the Eastern horseman’s razor-like scimitar is terrible.”

The Book of the Sword, by Sir Richard Burton, 1884, is a master-piece on the subject. Of curved or straight swords the author says :—

“The straight sword, used for thrusting, is hard to handle when the horse moves swiftly, and the broad straight blade loses its value by the length of the plain through which it has to travel. On the other hand, the bent blade *collects*, like the battle-axe, all the momentum at the ‘half weak,’ or centre of percussion, where the curve is greatest. Lastly, the drawing cut would be easier to the mounted man and would most injure his enemy.”

“This *dictum*,” says Colonel Elliot, “finally disposes of the popular fallacy that a straight sword is best for a mounted man. It is the best for a man *on foot* in the shape of a rapier, but introduce the horse into the question and the conditions are altered at once, as Burton clearly explains. . . . The *tulwar*, or half-curved sword of Hindustan, cuts as though it were four times as broad and only one-fourth of the thickness of the straight blade. But the ‘drawing cut’ has the additional advantage of deepening the wound and cutting into the bone. Hence, *men of inferior strength and stature used their blades in a manner that not a little astonished and disgusted our soldiers in the Sind and Sikh campaigns.*”

There can be little doubt that against infantry the lance is the best weapon for both ranks, but in cases where the sword, scimitar, or other cutting weapon is the *national* arm of the troops, it would seem a doubtful policy (at all events in the case of Asiatic troops expert in the use of the sword) to replace this by the lance, which is a weapon requiring great strength of arm to wield successfully, and as we have seen, Asiatics have not the strength or nerve of Europeans in the fight.

SECTION XII.

BITTING OF CAVALRY HORSES.

102. Our Cavalry Regulations lay down the following rules for biting, *viz* :—

- (a) "The bit should be placed in the mouth so that the mouth-piece is one inch above the lower tusk of a horse, and two inches above the corner tooth of a mare. This can only be laid down as a general rule, however, as so much depends on the shape and sensitiveness of the horse's mouth and on his temper.
- (b) The bridoon should touch the corners of the mouth, but should hang low enough not to wrinkle them.
- (c) The curb should be laid flat and smooth under the jaw, and should admit two fingers easily between it and the jawbone."

But no reasons are given for the positions selected for the above, nor are any directions given for constructing the bit, bridoon, and curb respectively, of the proper dimensions. Hence it is generally done by a rule of thumb, and without any regard to the correct principles of biting. The following extracts from a book written by Major Dwyer of the Imperial Austrian Service, entitled "*Seats and Saddles*," will give the information required above; *and, moreover, may be taken as an excellent guide for biting horses, especially "pullers."*

Principles of Biting.

The head is the lever by means of which we gain a command over the neck and control the motion of the whole animal. Big-headed horses, therefore, will be generally heavy in the hand.

The lever action is greatest when the head is at a right angle with the neck.

We can only master the horse by getting the point on which his hind legs—the organs by which he propels himself—to act completely under our control—which shows the absurdity of universal bits.

A rational method of biting demands that the bit should be confined exclusively to a certain point of the bars each side, and the bit cannot act properly on any other point than this. Hence the English rule regarding the place of the bit at a certain height above the tusk is a very clumsy one, as mares and even some geldings have no tusks..

The bit may be regarded as a pair of levers connected together by the mouth-piece. The

Action of the bit.

curb should be converted into a prop for the lever action on the bars of the mouth, which may be effected by rendering it perfectly painless, so that then the small amount of pressure exercised on the bars acting in the proper direction and not being counteracted elsewhere, is the sum total of pain it becomes necessary to inflict, and even this may be reduced to a minimum.

There are three dimensions of the interior of the horse's

Dimensions of the Bit.

mouth which must be accurately ascertained before attempting to fit him with a proper bit in addition to certain details regarding the tongue, *viz* :—

- (a) A very important one. The transversal width of the mouth from side to side measured at the same height as the chin groove and including the thickness of the lips. The width of the mouth is variable and depends on the breed and size of the horse. Of 592 horses of the Patiala Lancers measured, the dimensions of the mouth-pieces were as follows:—

1	...	...	...	5½ inches.
4	...	...	...	5½ "
16	...	...	...	5 "
272	...	...	...	4¾ "
299	...	...	...	4½ "

(b) The height of the bars, *i.e.*, the distance between a straight edge, supposed to rest on the upper surface of the bars and another straight edge placed exactly parallel to it and touching the undermost point of the chin groove. Very important, as all the remaining dimensions of the bit must be deduced from it. The height of the bars may be taken as $1\frac{1}{2}$ inches, never more, seldom less. This dimension is most important, because the upper part of the cheek of the bit should never exceed the height of the bar of the horse's mouth. Now, although there is little difference in the height of the bars of horses' mouths there is, on the other hand, a very great diversity in their shape and texture: some being flat-topped and broad, others again presenting a ridge-like surface. Some also spongy, soft, and comparatively devoid of feeling, whilst others firmer, finer and more sensitive; all this exercising an immense influence on the biting.

(c) The width of the channel in which the tongue lies (or the distance between the two bars internally) which determines how much of the mouth-piece must be allowed for the port, the remainder must be reserved for the action on the bars. This channel always bears a certain proportion to the height of the bars measured as described above. We must, therefore, take this latter

in the first instance. It is pretty nearly always $\frac{3}{4}$ of the bars' height, and as this is $1\frac{1}{3}$ inches the other will be about $1\frac{1}{3}$ inches which gives us the maximum width of the port of a bit.

N.B.—Dwyer's mouth-gauge for taking the above measurements for a bit can be obtained from Messrs. Cooper, Allen and Co.'s Factory at Cawnpore.

The tongue in some horses just fills its own canal neatly—in others it seems much too thick and fleshy for the interior of the mouth and projects in all directions. Now the volume of the tongue is very important, because the action of the mouth-piece is divided between this organ and the bars of the mouth, and the great nicety in biting is practically to determine for each horse how much of the lever action is to fall on the tongue and how much on the bars.

"Soft mouth"—there are two ways of expressing this: "This horse goes well on a light bit," which may be the consequence of good carriage, temper, etc., or we may say a light bit will suit this horse best, "because it has a thin tongue, high and sharp bars, a wide tongue channel and fine lips." In reality the relative thickness or thinness of the tongue is the main point to be considered.

"Hard mouth"—generally one with a thick fleshy tongue not only totally filling up its channel, but protruding over it. In this case an ordinary mouth-piece will exert its pressure mainly on the tongue and lips conveying to the rider's hand the dull feeling of pulling against lead.

Well-bred horses have better mouths for the above reasons. A common brute though is often sensitive to the action of the bit and averse to its contact, *i.e.*, "behind the hand," often owing to weak hind quarters, muscles, etc.

The measure for the length of the upper cheek of the bit taken from the centre of the rivet on each side to the point at which the curb hook acts, is the height of the bars, *i.e.*, $1\frac{1}{2}$ inches, or in round figures $1\frac{3}{4}$ inches, is the proper length for the upper cheek, very seldom less and hardly ever more.

Good biting lies between the two extremes to "fall through" and "stand stiff," *i.e.*, the angle that the cheek pieces make with a horse's mouth should vary between 45° and 30° when the reins are drawn tight. The length of the upper cheek will, however, of itself cause the bit to "fall through" or "stand stiff" if it exceed or come short of the height of the bars of the mouth.

The absolute length of the lower cheek should be diminished as much as possible so as to prevent the bit being lifted and cause the curb to mount up out of the chin groove. The greater the lower cheek the greater the space through which the rider's hand must move to produce a given amount of action.

"The lower cheek should be twice as long as the upper one:" this is an excellent rule, as it increases the lever action in the proportion of 3 to 1 which should

be under all circumstances ample. The length of bit should therefore be :—

			Inches.
Upper cheek	..	..	1 $\frac{3}{4}$
Lower "	..	..	3 $\frac{1}{2}$
Total			5 $\frac{1}{4}$

measured from the point at which the curb hook acts above to that where the lower ring acts below. This will be the maximum. With very small horses the upper cheek will have to be reduced to 1 $\frac{1}{2}$ inches, the lower one to 3 inches, total 4 $\frac{1}{2}$ inches, which will be the minimum.

The width of the part, *i.e.*, channel for the tongue, is 1 $\frac{1}{2}$ inches, for ponies 1 inch.

Its height is very variable, depends on—

- (a) Thickness of tongue.
- (b) Sensitiveness of bars.
- (c) Temperament and general confirmation of the animal.
- (d) Description of service.
- (e) Style of riding.

The mildest is the one whose pressure is almost entirely exercised on the tongue, proceeding onwards with an increase of port or "tongue freedom" to the very highest, *i.e.*, in which the height of the port is equal to its width, say, 1 $\frac{1}{2}$ inches. Beyond this the port would press against the palate of the horse's mouth. The thickness is important—as the greater the diameter the less painful will be its action on the bars of the

mouth. It should vary from $\frac{1}{2}$ inch to $\frac{3}{4}$ inch if less than $\frac{1}{2}$ inch it pinches.

“The chin or curb groove”—a certain depression

Action of the Curb.

under the chin known as the chin groove, and called by the Germans the curb groove—the point where the two branches of the jaw begin to unite together, and the bone beneath the thick and not very sensitive skin of the chin groove is flat, so that if a curb chain, which has proper width, acts in this groove, a considerable amount of pressure may be applied without causing any unpleasant sensation to the horse. Higher up at the angle of the jaw the bone has sharp edges and the skin is thin, hence pressure causes agony to the horse. The curb, therefore, has one fixed position in the chin groove, and this governs the whole arrangement.

It should lie in the chin groove without any tendency to mount up out of it on to the sharp bones of the lower jaw. The only way to attain that perfect painlessness of the curb on which so much depends, is by placing the mouth-piece on that part of the bars exactly opposite the chin groove. The best kind of curb, and properly constructed, and exactly of the length required, is absolutely necessary. A double chain worked quite flat without prominent edges and which, when twisted up to its full extent does not untwist, is the best kind of curb.

Select a curb as broad as possible that does not altogether fill up the chin groove.

Dimensions of the Curb.

Width about $\frac{1}{2}$ inch. The proper length for the curb $\frac{1}{4}$ more than the width of the mouth, the curb hooks not included.

The proper length of the curb hook is $\frac{3}{4}$ the height of the upper cheek or about $1\frac{1}{4}$ inches.

After teaching and mouthing the young horse, it becomes "a second string to the bow." Should never interfere with the bit, therefore it should neither be thick nor so absurdly long as it is sometimes. It should fit lightly into the angles of the lips without disturbing their natural position.

From the above we may lay down the following rules for adjusting the bit, curb, and bridoon, in the horse's mouth:—

Rules for Biting.

- (a) The bit should be placed in the horse's mouth so that the mouth-piece is in line with the chin groove, *i.e.*, generally just clear of the tusks of the horse and about an inch above the corner nippers of the mare.
- (b) The curb should be laid flat and smooth in the chin groove without any tendency to mount up out of it on to the sharp bones of the lower jaw. It should be adjusted so that when the bit is drawn back by the pull of the reins as far as it will go, the angle which the cheek piece of the bit makes with the mouth shall not exceed 45° with any horse, even the lightest-mouthed and with a hard-mouthed horse not less than 30° . This angle should, therefore, be varied between 45° and 30° according to the degree of hardness of the horse's mouth.

- (c) The bridoon should never interfere with the bit. It should fit lightly into the angles of the lips without disturbing their natural position, *i.e.*, as laid down in our regulations.

The dimensions of bit, bridoon, and curb chain made up by me for the use of the Patiala Lancers, are as follows :—

		BIT.	
		Officers.	N.-C. O.'s and Men.
Upper cheek	... $2\frac{1}{4}$ inches	... $1\frac{3}{4}$ inches.	
Lower "	... $4\frac{1}{2}$ "	... $3\frac{1}{2}$ "	
Mouth-piece (length),	<i>vide</i> page 343.		
" (thickness),	$\frac{3}{4}$	... $\frac{1}{2}$ "	
Port (height)	... $1\frac{1}{8}$ inches	... $\frac{7}{8}$ inch.	
" (width)	... $2\frac{1}{4}$ "	... 2 inches.	
Hook (length)	... $1\frac{3}{4}$ "	... $1\frac{1}{4}$ "	
Ring (diameter)	... $1\frac{1}{2}$ "	... $1\frac{1}{4}$ "	

		BRIDOOON.
Length	...	According to size of mouth, with $\frac{1}{4}$ inch to spare each side, and of ordinary thickness.

CURB CHAIN.
Double links, with 2 single ones at each end. Length $\frac{1}{2}$ more than that of each mouth-piece.

Breadth ... $\frac{3}{4}$ inch ... $\frac{3}{4}$ inch.

N.B.—The Officers of the Patiala Lancers are mounted on walers. Their bits have bosses.

SECTION XIII.

SADDLING OF CAVALRY HORSES.

THE following rules for the above by Lieutenant-General Sir F. Fitz-Wygram will be found invaluable.

1.—*Flesh and Skin v. Bone.*

103. The skin of the horse and his flesh, when covered by skin (but not otherwise), are adapted for bearing weight and pressure.

Bone, on the other hand, though much harder than flesh, is not adapted for sustaining either weight or pressure—not directly at least. It is not necessary here to enter into the cause why this is so; it is a fact, as every horseman knows.

Hence, in making a tree, it is necessary to relieve those parts in which bone approaches the surface from all pressure; hence, the need of the front arch over the withers, and the rear arch over the spine. It is absolutely necessary to relieve these bony parts from all pressure.

2.—*Of the Tree.*

The Military tree consists of three parts, *viz*:—

1st.—The front arch.

2nd.—The rear arch.

3rd.—The side bars or boards.

3.—*Length of the Tree.*

The length of a tree depends on its side bars or boards. In hunting saddles, short trees are used; in military saddles, longer trees are used.

Short trees, such as those used in hunting saddles, concentrate on small area the whole weight of the rider. There are many advantages in this concentration of weight on the middle of the back. Among others, it is obviously easy to retain a short tree in its place. The rise of the withers in front, the dip of the back in the middle, and the rise of the loins in rear, secure this great object. The saddle is, in fact, bedded in the natural hollow of the back.

But for military saddles, short trees are not available. The need of carrying wallets in front, and cloak or pack behind, and the great weight that has to be carried, necessitates a longer tree and a wider area of bearing.

4.—*Of the Side Bars.*

The side bars should be as short as is consistent with the need of carrying a cloak and wallets in front and pack or cloak behind.

The side bars should lie smoothly and evenly on the sides of the horse, *touching everywhere* (this is essential), except at their upper and lower edges, which are bevelled off, and except towards the termination of the front points and rear fans.

The fitting of the side bars may be conveniently considered under three heads, *viz.*,—1st, the fitting of the front points; 2nd, the general curve of the bars; and 3rd, the rear fans.

First, the front points should stand out clear of the shoulder, in other words, the front points should rise decidedly.—If the side bar is too straight in front, the front points will rest on the shoulder, and the saddle will, of course, work forward. There is nothing to prevent it. If a side bar cannot be found or altered by bevelling to clear the shoulder, the remedy is to cut off the portion in front of the arch, and to substitute for it an iron plate well turned up (of the same length as the portion cut off) with a movable D at its end for the wallet strap to go through. This alteration will place the weight-bearing portion of the saddle behind the play of the shoulder, and in most cases will cause the saddle to remain in its proper place.

Second, of the general curve of the side bars.—The curve should exactly follow the line of the horse's back. If the back is hollow, more curve will be needed; if the back is straight, less curve.

In some horses, with thick shoulders, rather hollow backs, and rising loins, it will be found that the regulation side bar is too straight, and, in consequence, gets a bearing only on the shoulder and on the loins. If the side bar be carefully felt along the back, an interval of a finger's breadth or more will in such case be found between the back and the boards. This is a great evil. There must be undue and excessive pressure on the two points, on which alone the saddle gets a bearing. Not only so, but the saddle, not being properly bedded behind the shoulder, must work forward. And again the elevation of the front of the saddle causes a corresponding depression in rear, which

displaces the weight of the rider, and causes the rear points to chafe.

(*Memo.*—The interval objected to above must not be confounded with the slight dip or recess which is made in all side bars for the passage of the stirrup-leathers.)

The remedy is to find a saddle with more curved side bars. If none such can be found, new side bars should be made, if there is time and opportunity. If there is neither, the alternative is to cut off the front points, as recommended above, and *also to cut* two or more inches off the rear fans, and attach the portion cut off by means of hinges of iron or leather to the upper surface of the side bar. These measures combined will probably give complete relief.

There is also an opposite evil. In many cases the side bars are too curved for straight-backed horses, and get a bearing only on the centre of the back. Undue pressure, no doubt, comes on the centre of the back, and a sore *may* occur *there* in consequence. But the mischief more often shows itself elsewhere. The saddle has no grip. It will rock about and shift, and it is difficult to say where the mischief will occur.

This class of misfit is easily detected, if one hand is placed on the front arch and the other on the cantle. The tree should not move under strong pressure so applied. If it tilts up and down, the side bars are too curved for the back.

The remedy is to find a saddle with straighter bars. This can generally be done. If it cannot, the side bars may be reduced to the extent of three-eighths of an inch by shaving in the middle without very unduly

weakening them. In some cases it may be necessary to make new side bars.

Third, of the rear fans.—The rear fans are the portions of the side bars, which project beyond the rear arch—they are known also as rear points. These are sometimes too long for short-backed horses. Long fans are very objectionable, because the action of the loins has a tendency to force them forward, and with them the saddle. The remedy is to cut them shorter.

In other cases the rise of the fans is not sufficient to clear the rise of the loins; the remedy is as above.

Side bars ought to vary in length, and curve according to the conformation of the horse and the length and dip of his back. All military side bars are, however, issued of the same length and curve; but though nominally the same, there is a difference between them, and hence it is more often possible to find side bars suited to particular horses than might be expected.

The War Department will, however, issue side bars in the *rough* on application, and also some of double thickness, which can, of course, be fitted by the saddle-tree-maker, or wheeler, or regimental artificer to any horse. When there is time and opportunity to get side bars in the rough and make them up, it is best to do so. But the alterations recommended above will answer sufficiently well in most cases, and can be made *at once* by the saddle-tree-maker.

In some cases an alteration of the position of the girth straps on the side bars may also be needed (see Girths, paras. 20 and 22; also Saddle slipping forward, para. 18).

5.—Fitting of the Front Arch.

On high-withered horses the under surface of the front arch should lightly touch the top of the withers.

On low-withered horses an interval of one or two inches should be allowed.

The object in either case is to make the saddle level fore and aft, so that the rider may sit in the middle.

N.B.—Many horses with low withers will carry the saddle with pannels within one inch of the same measurement as when without pannels.

On the other hand, in horses with high withers, the insertion of the pannel will often raise the saddle three inches above the withers, although the tree without the pannels touched the top of the withers.

N.B.—Under-bred horses are generally low in the withers. Well-bred horses are often high in the withers.

It has been generally taught that the front arch should in all cases stand an inch and a half clear of the withers. This cannot be attained in all cases.

The saddle must be level as a seat for the rider: but, having regard to this, the front arch and tree generally should be as close to the back, both fore and aft, as will give security, that no actual pressure comes on the withers or backbone.

If (as recommended for high-withered horses) the front arch without pannel touches the top of the withers, it will be found that there is, when the pannels and

nundah are inserted, an interval of at least an inch or two fingers' breadth between the withers and the arch. This is sufficient, and any greater interval is an evil.

Any greater interval will unduly raise the saddle and the rider above the horse's back, and will cause the saddle to oscillate; and it will unduly raise the cloak, and will place the rider's hand unduly high.

In lower-withered horses a somewhat greater interval between the withers and the arch is generally necessary, in order to make the saddle level fore and aft, and thereby place the rider in the middle of the saddle; but it is an evil.

It may be said that the stuffing of the pannels will sink on a march of many days or weeks. I am aware of it. Except for that contingency I should prefer to reduce the interval by one-half, *viz.*, to one finger's breadth, the interval usually allowed in hunting saddles.

It may be said that horses will fall away in condition on service, and that a greater interval and a larger amount of stuffing should be allowed, in order to provide against this contingency. This point is further considered in para. 23, "Saddles on Service."

6.—*Injuries to the Withers.*

It may be here observed, that injuries to the withers nearly always occur on *the side, not on the top*, and therefore do not arise from saddles coming down on the withers. An injury to the top of the withers, when it occurs, generally arises from a strap getting loose.

As a general rule, the *upper part of the side* of the withers is affected. This is due either to the front arch *being too narrow* in the neck, aggravated in some cases by too much stuffing in the pannel; or to its being *too wide below*. Either of these misfits will cause an undue pressure on the upper part of the sides of the withers. Both misfits are often found in combination, and the liability to injury will of course be increased.

The remedy in the first case is to find an arch wider in the neck; in the second case, an arch narrower in the lower portion of its fork. If both misfits are present, an arch wider in its neck and narrower in the lower portion of its fork will be needed.

It is essential that the front arch should have an even and continuous bearing on the sides of the horse from its neck to the lower end of the bar, and, if possible, the points of the arch.

Injuries to the withers generally occur on the *near side*. This is due to the extra weight of the carbine which causes the saddle to heel over to the *off side* and thereby produces undue pressure on the near side. This tendency to heel over to the *off side* will be lessened by very slightly decreasing the stuffing on the *near side*. It will in fact give the saddle a slight list to the near side, which will bring it practically level, when the extra weight (the carbine) comes on the *off side*.

The contrary plan of increasing the stuffing on the near side has been generally taught, and has only increased the evil.

Again, many men ride with a slight list to the off side and with the near stirrup one hole shorter than the off. This irregularity will also cause the saddle to chafe the near wither. This should be seen at once by the inspecting officer, and corrected by causing the men to sit upright and ride with their stirrups even.

The girths should be looked to at the first halt, and tightened, so as to maintain the saddle in its place as far as possible.

7.—*Fitting of the Fork of the Front Arch.*

The proper position of the fork of the front arch is *behind the shoulder*. It is absolutely necessary that the fork should be *bedded behind* the shoulder as in the hunting saddle. It must not rest on the shoulder, but behind it.

If the fork rests on the shoulder, the saddle must work forward. There is nothing to prevent it. Again, if the fork rests on the shoulder, the tree will get a bearing on two points only, *viz.*, the shoulder and the loins—and saddle galls will probably be the result. The space between the shoulder and the loins, which is the proper weight-bearing surface of the back, will receive hardly any weight—though, of course, in many cases this misfitting is to a certain degree corrected by an undue amount of stuffing in the middle of the pannel.

The *sides* of the *fork* should lightly touch the sides of the horse the whole way down. It is not

necessary that the sides of the fork should stand out from the horse in order to admit the pannels. The insertion of the pannel and numdah will raise the whole of the front arch, and thereby practically increase its width; though, at first sight, it might seem as if the contrary would be the case.

It is essential to the steadiness and grip of the saddle that the sides of the fork should touch the sides of the horse *all the way down*.

If the fork touches only one part, there will be increased and undue pressure on that part, and the result may be a chafe or sore. I attach the greatest importance to an even and a continuous bearing of the fork; very commonly the fork touches only at its upper end, and the whole weight and pressure *then come on that part only*. Hence sore or pinched withers.

8.—*Fitting of the Rear Arch.*

The rear arch is raised in the centre more than is necessary to clear the backbone or spine, in order to carry the pack. It cannot, therefore, be fitted on the same principles as the front arch; in fact, it cannot be fitted at all. Its primary use is to connect the two side bars, which are attached to it. The fitting of the rear portion of the saddle is dependent on the side bars rather than on the rear arch.

9.—*Fitting of the Tree.*

Having described in detail the fitting of the side bars of the front arch and its fork, and of the rear

arch, little remains to be said as to the fitting of the tree generally. If the component parts all fit, the tree will fit everywhere close to (except at the arches front points and rear fans) and securely on the back.

The tree must be fitted without its pannels. If it fits, it will be firm on the horse's back. It will not yield to pressure. If the bars fit, and if the fork be bedded behind the shoulder, it will not "rock" up and down under the strong pressure of the two hands grasping it at the front arch and cantle; nor will it yield *to the side* even under strong pressure, if the fork fits closely and continuously to the sides of the horse.

After fitting the tree on the bare back, it should also be fitted *over* the numdah. Though the numdah is smooth and level throughout, it necessarily raises the tree to a certain degree, and so, to a slight extent, may alter its position on the back. Hence it is possible that a tree, which fits well on the bare back, may not fit equally well, when its position is, to a certain extent, altered by the insertion of the numdah. The same remark applies to the insertion of the pannels. These points should, therefore, always be looked to after fitting the tree on the bare back.

An interval of fully $1\frac{1}{2}$ inches will be obtained (even though the front arch touches the withers) when the pannels and numdah are inserted. It is true that the pannels ought not to be more than an inch thick; but, by closing up the front arch, they will cause the arch to stand at least that much above the withers. If the stuffing is new, and therefore liable to sink, half an inch more interval may be allowed.

10.—Of Stuffing.

The primary object of stuffing—by whatever name it may be called—pannels, numdahs, blankets, etc., is simply to prevent the hardness of the side bars and fork from hurting the skin and underlying flesh.

Just so much stuffing should be used as will effect this object. The weight of the hair in each pannel should not exceed 12 oz. All that is more than this is an evil; though, in some cases (of which hereafter), a necessary evil.

If the tree fits perfectly, the stuffing should be even all over. But trees, as a general rule, do not fit perfectly. Hence, in such cases, more stuffing will be required in one part than in another, in order to adjust the tree to the back.

Of course, it is possible to make a tree which shall exactly fit the back of the horse for which it is intended. But, in practice, it is easier to correct any slight misfitting by an alteration of the stuffing than it is to alter the tree.

The necessity, however, of more stuffing in one part of a pannel than in another, is an invariable sign that the tree does not fit the back *accurately*.

If *much more* stuffing is required in one part than in another, it is a certain sign that the tree is not suited to the horse, and it should be changed.

In the army, trees are made in certain regulated sizes; and all that can be done is to find the tree which may be the best, though it may not be a very good fit.

In practice, however, it will be found that there is a considerable difference even in trees of nominally the same size. Hence, it is more often possible to find suitable trees than might be expected, under a system of only three regulation sizes.

11.—*Objections to Extra Stuffing.*

It may be asked, what is the objection to an increased quantity of stuffing, if it be the means of making a tree, otherwise unsuitable, fit well ?

1st.—Increased stuffing raises the saddle unduly above the back, and gives an undue roundness to the under surface of the pannel, and thereby reduces its bearing surface (see next paragraph). When the saddle is thus raised, it does not obtain that firm and general grip on the horse's back which is essential to *steadiness*: it will rock, oscillate, and, by the friction so induced, will cause chafes and sores.

2nd.—Large quantities of stuffing, after a time, become so impregnated with sweat, that the stuffing itself becomes as hard as the boards.

3rd.—The stuffing, if unduly thick, is apt to get into lumps, and then causes undue pressure on particular parts.

4th.—Any unnecessary raising of the front arch places the rider's hand in a disadvantageous position for controlling the horse.

12.—Of *Stuffing Pannels.*

Pannels should be stuffed nearly flat ; of course, the edges must be bevelled off. But the practice of stuffing pannels "half round" is wrong. When so stuffed, only a portion—much less than the proper portion—gets a bearing on the back. Hence, first, a liability to chafe from pressure coming on an unduly circumscribed area ; and, second, a want of firmness or grip of the saddle on the back, and hence a great liability to oscillation.

Again, the pannels should be so stuffed "lengthways" that the whole length of the pannel, until it comes to the upturn of the fore and aft ends or fans, should get a fair level and continuous bearing on the back, for reasons similar to those mentioned.

An excellent plan for increasing the stuffing without adding more hair, and for avoiding that roundness of bearing which overstuffing produces, is to insert a piece of numdah eight or nine inches in length, and as wide as the bar under the rear arch between the pannel and the bar, which will raise the rear points ; or to place a piece of less length under the centre, which will give more curve ; or under the front bearings, which will raise the front of the saddle. In some instances, where the horse has fallen off generally in condition, a piece of numdah twenty inches long, *i.e.*, the whole length of the side bar, may be necessary. The edges of the numdah must be slightly shaved.

This method, especially on service when many horses may, from hard work and other causes, fall off suddenly in condition, will be found the quickest and the best, and it can be carried out without a saddler.

13.—*Of Stuffing Flaps of Pannels.*

The flaps of the pannels should not be stuffed at all, except a small portion in front, about three inches wide, which may be useful as a support to the knee. The leather and its lining of flannel are quite sufficient protection to the sides of the horse, but a little padding is necessary to keep the flap in its position. Stuffed flaps widen the breadth between the rider's legs and lessen his grip. Again, unstuffed flaps will lie close to the horse's side, and therefore will not catch on the top of the boot, an inconvenience often complained of with heavily-stuffed flaps.

14.—*Numdah Pannels.*

Numdah pannels are fitted on the same principle as the Service pattern pannels.

They have, however (in my opinion at least), several advantages, *viz*:—

1st.—They are level throughout—which almost necessitates proper fitting of the tree.

2nd.—They are thinner, and therefore bring the saddle nearer and closer to the back.

3rd.—They are not liable to get into lumps like stuffing.

4th.—Any required alterations can be more easily made than in the stuffed pannel. Additions are made by sewing one or more strips of numdah on to the upper side of the pannel, on the part which requires such addition. Two thicknesses make an excellent pannel.

15.—Of Fitting the Saddle with Pannels.

The first and great essential is to get a tree which fits. Having found it, or by means of the abovementioned adjustments having made it to fit, the pannels, lightly and evenly stuffed, may now be put on the tree.

The saddle ought to fit. But it often happens that it does not quite fit, and some very slight alteration of the stuffing may be needed.

Any inaccuracy in the fitting should be adjusted, in the first instance, by *taking away stuffing* from a pannel with more than the above quantity of stuffing, leaving only enough to protect the back from the hardness of the boards. When this has been done as far as possible, recourse must be had, if further measures are needed, to adding stuffing to other parts requiring it. It is, however, most important to bear in mind in matters of adjustment, that adding half an inch of stuffing to one part when half an inch has been taken away from another part, is equivalent to adding an inch. Hence, inasmuch as much stuffing is an evil, it is always advisable to *begin* the needed adjustment by taking away stuffing.

In most cases, however, where much adjustment is needed, the bare tree should be replaced on the horse, and it will probably be found on re-examination that the tree *does not really fit*, or that the incidence of pressure has been altered by the insertion of the numdah or pannels.

NOTE.—When the stuffing in a pannel is lessened, the lining must be refitted. If this precaution is not taken, the stuffing will be apt to shift.

Care must also be taken that the borders of the lining, when the stuffing has been reduced, do not turn in under the pannel, which will be likely to be the case, if the lining is not refitted.

The facing round the rear portion of the flap of the pannel, commencing from immediately in front of the bearing of the girth, had better be removed in re-stuffing.

Care must also be taken that the pannels are not too long. The pannels made for the old wooden saddles will not fit the iron-arched saddles, unless altered, the side bars not being of the same length. If the pannels are too long, the tree will move backwards and forwards on them when the horse is in motion.

Pannels should not be removed from the trees for the purpose of being cleaned. It is sufficient to brush them or beat them lightly with a switch. But if any regiments wish to beat the pannels against each other, they must be slightly quilted, which will prevent the stuffing from shifting under such rough treatment.

16.—*Adjustment of the Seat.*

Having fitted the saddle to the horse, it is *also* necessary to fit or adjust it as a *seat for the rider*.

It is essential that the rider should sit in almost the middle of the saddle. In order that he may do so, it is essential that the *seat* of the saddle should be level "fore and aft." The saddle may fit the horse's back accurately without the seat being level fore and aft. In order that the rider may sit naturally in the middle, the

middle of the seat must be lower than either end. The *lowest* dip of the seat should, however, be a *little* in *rear of the centre*.

For the purpose of the rider, the saddle must be made level fore and aft. With the present *fixed* seat this should be effected by reducing the stuffing in the part (be it fore or be it aft) which is too high; and, second, if it cannot be entirely remedied by this means, by adding stuffing to the part which is too low in the manner described in para. 12.

If the seat of the saddle is too low behind, it will throw the rider on the back of the saddle, and thus further depress the part already too low. This depression behind will elevate the front part, and will surely cause the saddle to work forwards.

If, on the other hand, the saddle is too high behind, it will throw the rider on his fork.

The adjustment of the seat will be best ascertained by standing on one side of the horse, and a little way off. The eye must be the guide to this.

It would probably be better if an *adjustable* seat were used instead of the fixed seat. The saddle could then be fitted to the horse, and afterwards, without disturbing the fitting of the saddle, the seat could be adjusted for the benefit of the rider.

17.—*General fit of the Saddle.*

The saddle must be placed on the back, where from his conformation the horse is likely to carry it. With

an upright shoulder this will necessarily be a little more forward than with an oblique shoulder. In all cases, however, the *front arch and its fork must be behind, not on the shoulder.*

After fitting the saddle and adjusting the seat it is always advisable to feel the saddle before you are satisfied with the fit, to ascertain that it clings everywhere, that it will not rock or shift under the strong pressure of the two hands either fore or aft, or from side to side. If the trees and pannels really fit, the saddle will be quite firm on the back.

In *new* saddles, when the piece of webbing which is stretched across from bar to bar (to prevent pressure on the seat from the saddle-pin) is *tight*, it may happen that it will press on the backbone, and thereby prevent a really well-fitting tree from sitting tight and close. In such cases the webbing is too tight, and may be loosened, if necessary. But it generally stretches after being on the saddle-pins a short time.

In placing the hands on the saddle to ascertain that it clings everywhere, great care should be taken that the horse is standing square to his front, and that his head is raised and held in the same position as when mounted.

Rocking or want of firmness, even if the tree fits, is often caused by the *pannels* not getting a fair level bearing on *all* that area on which the saddle ought to rest ; for example :—

If the pannels, which are intended to have a bearing of at least four inches “breadthways” on the back, are so stuffed, *i.e.*, half round, that they have a bearing of

only two inches on the back, the saddle will sway from side to side.

Again, the pannels may be so stuffed, that only the centre portion gets a bearing on the back. The saddle, if pressed by one hand in front and by the other behind, will tilt up and down.

Again, the sides of the pannels at the lower portion of the front arch may be away from the horse's sides and the saddle under pressure will oscillate from side to side. In this case the front fork is in fault.

18.—*Of Saddles slipping forwards.*

As a rule, military saddles are complained of as slipping forward; there are several causes, which either singly or in combination induce this tendency:—

1st.—Side bars not sufficiently turned up in front. In this case the saddle gets a bearing on the shoulders instead of behind them, and then there is nothing to prevent its working forward. For remedy, see para. 4.

2nd.—Front arches too narrow in the upper part of their bearings. This misfitting (in addition to being the common cause of sore withers, para. 6) will raise the saddle too high, and will prevent the front arch from getting a proper bearing behind the shoulder. The remedy is to change the tree for one wider in this respect. In slighter cases it may be sufficient to reduce the stuffing in front.

3rd.—Front arch too wide in its fork. In this case the arch gets no proper grip behind the shoulder, and the saddle must work forward. The only remedy is to change the tree.

4th.—Saddles lower behind than before. (See para. 16, Adjustment of seat.)

5th.—Too much stuffing in front. The misfitting prevents the tree from lying properly behind the shoulder. The remedy is to take out a portion of the stuffing.

6th.—Improper position of the girths and girth straps. (See below, paras. 19 and 22.)

7th.—Closely connected with this latter—shallow chests. A shallow chest has a tendency to allow the girth to work forward, and with it the saddle. The evil of a shallow chest cannot be rectified; it is the conformation of the particular horse. The best remedy is to take away all the stuffing under the front points of the bars; or, if this be not sufficient, to cut off the front points altogether. The pannel must then be finished as in a hunting saddle. In addition a tree must be found, which fits particularly well and close with as little stuffing as possible; and the whole saddle must be kept as low and close to the horse as possible. The latter remedy, *viz.*, the removal of the fronts, will be found effectual in all cases; but it is not desirable to resort to it, if it can be avoided, as it occasions a difficulty in securing the wallets.

The front girth strap should also be moved forward, so that the girth may get at once into the place most suitable to the conformation of a shallow-chested horse. Nothing can be effected by putting the girths back. The girth will from the conformation of the horse go forward. (See para. 19.)

With great care shallow-chested horses can be so fitted, that the saddle will not work forward ; but there is need of care and skill to prevent it.

8th.—Big bellies. These have often much the same effect as shallow chests. In addition to the remedies recommended for shallow chests, it is well to try the effect of reducing the allowance of hay and muzzling.

9th.—Some horses, on being mounted, kick until they have got the saddle forward, perhaps almost on their necks ; and then, in some cases, go quietly.

There are several causes of this vice :—

A.—The most common cause is non-fitting of the saddle when the horse is young. Many saddles are too wide for young horses, and easily slip on their necks. The horse gets used to this position of the saddle, and resents any interference with its usual position : in fact, kicks, until he gets it there. (N.B.—Great care should be taken in fitting saddles to young horses. For breaking purposes it will be found a good plan, when the saddle with pannels does not get a suitable bearing on the unformed back, to use the tree without pannels on two numdahs. After a week's riding, when the horse's head is raised and the back slightly altered, the pannels may be substituted for one of the numdahs.)

B.—Other horses kick, apparently from vice, when first mounted. If the saddle is displaced by this kicking, it should be carefully replaced, for fear the horse should acquire a habit of carrying it in its wrong place.

C.—In other cases some injury or tenderness of the loins or kidneys may cause the horse to endeavour (by

kicking) to push the saddle forward. In these cases, as soon as the cause is ascertained or suspected, the pressure should be taken off the loins, by alteration of the side bars and by adjustment of the stuffing. Relief can generally, but not always, be given.

D.—Other horses, cunning animals, apparently resort to the trick of getting the saddle forward (by kicking) to avoid being properly “collected.” The animal finds a kick or a buck, pushes the saddle and the rider forward, and then finds that he can get out of hand.

The saddle should be carefully replaced, and the girth re-adjusted as soon as any displacement has taken place. In time the horse will find the trick useless, and will give it up.

In *all cases* of a saddle getting forward by *kicking*, shortening, turning up, or even cutting off, the rear fairs, will be found very beneficial.

19.—*Position of Girths.*

Girths *will* ride in that place which is natural to the conformation of the particular horse. If the horse is shallow in the chest or pot-bellied, the girth will work forward; it is useless to attempt to prevent it. Cape and split girths, however, get a better grip than the regulation girth, and are, therefore, less liable to shift. The ordinary worsted web girth used in civil life gets a still better grip.

The best plan is to put the girth forward at once into its natural place. If it is put farther back, it will work

forward on account of the decreasing width of the horse and when it has so worked forward it will—it must become slack (because it is now round a narrower portion of the frame), and will then cease to have any effectual hold on the saddle.

When the slipping forward is due to a pot-belly, something may be done by keeping the horse short of hay and muzzling him.

The most troublesome cases are those where, from some peculiarity of action, the girth chafes the back of the leg. For these cases it has often been recommended to attach a third girth strap as far back as the cantle of the saddle, or a second girth similar to mule saddles or Mexican saddles.

The only real remedy is to get a saddle which will fit well behind the shoulder, and to adopt one or other, as the need may be, of the remedies recommended above. If the saddle is so fitted that it will stay naturally behind the shoulder, there will not be much trouble with girth galls.

The girth should be kept greased and soft, particularly those parts that lie behind the elbow of the animal. If so treated, it will get a better grip than when hard and glossy.

The grip of the girth will also be improved by narrowing the surcingle on that part that is worn over the girth. A surcingle of nearly equal width with the girth increases its hardness and want of power of getting a grip.

20.—*Length of Girths.*

In the late Egyptian campaign, when horses fell away in condition from hard work and short food, it was very generally found that the girths were too long and could not be shortened sufficiently.

This proved to be a great evil. It takes a good deal of time and trouble to cut and shorten a girth.

It is not probable that horses will ever be more lusty than in usual home barrack condition. It is therefore recommended that the girths of all, except young and growing horses, should be fitted, so as to be worn at home in the second or third hole from the free end of the girth strap. New girths stretch from two to four inches.

21.—*Length of Surcingles.*

A similar complaint was made in regard to the surcingles, which also proved to be too long. All surcingles should therefore be shortened by sewing the strap so much higher up on the surcingle as will cause it to be worn in the second or third hole from the free end.

If on service a greater degree of shortening is required, it may at once be effected by narrowing the surcingle itself, so that it may pass through the buckle. This can be done with a knife in a couple of minutes.

Temporary pads for surcingles (in order to prevent their cutting the backbones), when blankets are worn in camp, can always be made by utilising for the purpose

any spare articles of clothing, such as pairs of socks, or a shirt, or a horse-rubber, or by tearing up a few corn sacks, in cases where the ordinary camp plan of a pad of hay or straw, or rushes or heather is not available.

When numdahs *only* are worn in camp, as in Egypt, to keep the sun off the spine, a sufficient pad can be made by rolling up the sides of the numdah, until they nearly meet at the spine. In this case the object is not warmth as when blankets are worn for protection from cold; but simply protection to the spine from the sun.

22.—*Position of Girth Straps.*

In the *present pattern* saddle the girth straps, in some cases, need to be shifted further forward in order to depress the front of the saddle, and so prevent its riding forward.

It must be remembered that the saddle is carried forward with the girth if the latter shifts forward. If, however, the girth straps are placed further forward on the tree, the girth also will of course be more forward; but the saddle necessarily remains behind the girth, and is thereby retained more nearly in its proper position. This point seems to me difficult to explain in writing; but if the reader will kindly give it due consideration, he will, I think, find the effect to be as stated.

In some horses of peculiar conformation a third strap, fastened in front of the cantle, will be found to have a remarkable effect in *steadying* the saddle, and thereby preventing sore backs. As explained in the preceding paragraph, this strap has no effect in keeping the girth in what is called "its place."

23.—*Saddles on Service.*

There is a common idea that saddles ought to be over-stuffed in barracks, because on service the horses may probably fall away, and then more stuffing may be required.

There is no sense in this idea. There is no sense in giving a horse a sore back in peace time for fear he should have one in war time. On the contrary, horses, whose backs have become tender from constant sore backs in peace, will be the most difficult to manage under those adverse circumstances which are pretty sure to occur in war.

Saddling, *i.e.*, the fitting of saddles, ought to be attended to from day to day. If an officer in peace time gets into the habit of looking to his saddles from day to day, and adjusts them as the horse improves in or loses condition, if, in short, he thoroughly understands his business from daily practice, he will not be in much difficulty in war.

If, on the other hand, he has not learnt in peace time the art of fitting saddles, he is not likely to be able to pick up intuitively a somewhat difficult and delicate art in the emergency of war.

Horses will fall away under hard work and short rations in war. More stuffing will be needed in the pannels to supply the loss of flesh. A supply of horse-hair and numdah are always carried with the regimental stores, but it may be exhausted or lost. As a substitute a piece of numdah cut to the shape required, and inserted between the pannel and the tree, will answer better than adding more horse-hair. A common

thin "country blanket," folded as may be needed, answers better than anything else. Thick English blankets do not answer. For some reason or other they get no grip. Again, as horses die or become disabled, the numdah of the disabled horse may be appropriated, and will be useful in addition to that usually worn.

If none of these are available, straw, hay, grass, or rush mats which can be made in almost any country, will be found to answer very well. A handy man can plait two or three such mats in an afternoon. A mat can be chambered in its original construction without difficulty, or a hole may be cut in it, and the edges of the hole or chamber bound round with string.

I attach the greatest value to such mats, because they can be made almost anywhere and under almost any circumstances. They should be worn between the numdah and pannels. No attachment is necessary. They will ride quite securely.

But in order to teach their value, it is desirable that the pannels in one troop in each regiment should be removed at the commencement of the drill season, and the horses ridden with numdahs and mats only, for three weeks. Mats will last that time.

24.—*Conclusion.*

If the tree and the pannels fit, there ought not to be any sore backs, if, in addition to the above, the saddling and the putting on of the kit and the riding of the man are good.

But these latter subjects are quite distinct from those which have been considered above. Sore backs and

girth galls are easily caused by bad saddling and bad riding, even though the tree and the pannels fit perfectly.

Saddling, including, in the general sense of the word, the fitting of the saddles and putting on of the saddles and the kits, is the province of the troop officer. The riding-master may assist with his advice, and of course attend to the saddling of the young horses before they are dismissed; but with that exception the responsibility of all connected with saddling must rest with the troop officer, and with him alone, under the supervision of the field officers.

SECTION XIV.

PACK SADDLES.

The following extract from "Military Transport in India," by Captain Wickham, Assistant Commissary-General, will be found instructive.

104. The dorsal column of an animal consists of a line of small bones bound together by ligaments. Each of these bones has two ribs attached to it, one on each side, and also a bony process on the top called a spine.

Covering all the above bones are muscles, skin and hair. The bony processes which grow upwards from the vertebræ between the shoulders are long and but

slightly protected; consequently they are easily injured. Behind the shoulder they are much shorter and are protected by a thicker layer of muscles. The ribs between the shoulders are flat and run down nearly straight from the spinal chain to the breast bone. The vertebrae of the loins are not made to bear weight, as they have no ribs to support it, and pressure on the loins is very liable to cause injury to the kidneys. It is therefore evident—

(a) That the withers are not made to carry weight, as the ribs here have no weight-bearing surface, and any pressure on the upper surface would result in injury.

(b) That the real weight-bearing portion of the back is the flat surface on each side of the backbone from behind the play of the shoulder to the beginning of the loins.

This surface in the average pack mule or pony is about one foot long and three to four inches broad on each side. In the donkey it will be less. In the camel the surface will be double the above measurements, and in the elephant they will be nearly quadrupled. A really good pack-saddle for any animal should therefore be manufactured on the principle that the real weight of the load will be supported by the true weight-bearing surface; but at the same time to secure rigidity and stability a moderate pressure may be applied to the sides of the dorsal ridge and on the portions of the ribs immediately below the true weight-bearing surface.

The pack-saddles used in India for mules, ponies, bullocks and donkeys, may be divided into three classes :—

(a) *The Ordnance pattern saddle* at present used for Government mules and ponies, which has a tree formed by two iron arches fixed to wooden side bars and stayed by two iron rods running from the front to the rear arch.

The side bars are secured to two leather pads lined with serge and stuffed with wool.

(b) *"Súndkha" saddles*, in which the weight is kept off the backbone by a long roll called a súndkha, which is made of gunny and stuffed with long grass; the middle of the roll passes in front of the withers and the two ends are brought back on each side of the back and loins. Over the súndkha is fastened a pad to protect the ribs from the pressure of the load. In some of these saddles the súndkha is divided, and consists of two short rolls pressing on the proper weight-bearing surface of the back.

(c) *Single, or double pads*.—The former fully stuffed over the weight-bearing surface and hollowed over the backbone—the latter with the pads joined together over the backbone by pieces of stout webbing.

The present Ordnance pack-saddle is the result of various experiments and trials, but it still causes sore backs, and further improvements are now contemplated. At the time of the last Afghan war,

the iron arches of the tree were continued down to the lower edge of the pads. This was found to be unsatisfactory, as the fixed iron arches could not accommodate themselves to the expansion and contraction of the chest, and they pressed on the sides to such an extent as to impede the surface circulation.

The result of this was that large hard sit-fasts formed under the saddles at about the spot where the girth straps meet the girth buckles.

The healing of these sit-fasts was very slow; the dead skin had to be poulticed before it could be removed, and in many cases the animal was thrown out of work for two or three months.

The continuation of the iron arches were accordingly removed.

At this time the wooden side bars were straight and, there being no generally recognised method of fitting and stuffing saddlery, the saddles were allowed to slip forward on to the animal's withers, which were galled by the pressure caused by the straight side bar, and many cases of fistulous withers occurred.

The straight side bar was then abandoned and a curved one instituted the convex surface resting against the animal's back.

The curve was, however, so arranged that the whole pressure of the load was sustained by a space about three inches square in the middle of the weight-bearing surface.

Moreover, the fact was not taken into consideration that the mule, instead of having a slightly hollow back like a horse, is inclined to be roached in that part, a conformation calculated to reduce the weight-bearing surface to a minimum when a curved side bar is used. The result of the curved side bar is indelibly illustrated on the back of every transport mule worked previously to 1891. In the centre of the weight-bearing surface will be formed either an old scar or white hairs, the result of undue pressure on this particular spot. Accordingly the curved side bar was rejected and the straight one re-introduced.

This gives a uniform pressure over the weight-bearing surface, and as long as the saddle is kept behind the withers, the results are satisfactory. The conformation of a mule's shoulders, withers and belly is, however, such that there is a constant tendency for the saddle to slip forward, and when this happens there is great danger of the withers being bruised by the ends of the straight side bars. When going up steep hills there is also the probability of the rear ends of the side bar pressing unduly on the loins and injuring the kidneys.

To remove this objection, it has been proposed to give a slight curve to the front and rear ends of the side bar, leaving it perfectly flat for about nine inches in the middle, so that it will press evenly on the weight-bearing surface of the back. Samples of these improved bars are now under trial.

The trees of the Ordnance saddles are issued in three sizes to suit the different widths of backs.

The Ordnance saddle pad is faced with stout leather. Along its lower edge is sewn a leather strap, to each end of which is secured a hook to receive the breeching and breast-piece chains.

Two other saddles similar to the Ordnance pattern, are now under trial.

New Saddles under trial.

One, invented by a Naval officer, has jointed arches which open and close to fit the backs of different animals, and the pads are lined with layers of cork, a numdah being first placed underneath them.

The second (the Marriot-Allen saddle) has the present Ordnance pattern tree, but the pads are made of corrugated India-rubber, and can be inflated with air or filled with water.

This ought to be a valuable improvement if the hollow pads can be made strong enough to stand continued pressure without bursting.

Sundkha saddles in various shapes have been tried for transport work, but have not been found satisfactory.

Sundkha Saddles.

A great deal depends upon the sundkha being kept in thorough repair and properly adjusted under the pad.

When these points are well attended to, the sundkha saddle answers admirably; but it seems impossible to impress upon our present class of driver the necessity

of attending to these details, and regimental supervising establishments seem unable to cope with the difficulty. A carelessly-fitted *súndkha*, or one in which the rolls have shifted, and do not rest on the weight-bearing surface, and thus protect the spine, is sure to give a sore back, and the results of using this description of saddle for military transport have been for the most part disastrous.

Single pads of different descriptions have also been used for pack work, but have never been found satisfactory. The sides of the pads lying over the weight-bearing surfaces are stuffed so as to protect the spine, but without constant care and skilful adjustment the stuffing gets pressed down, the pad is pulled out of shape and the spine is galled.

The American *Aparejo* pad, described by Furse on pages 287—290, is an exception to the above rules; *but in America pack-animals are always placed in the hands of skilful packers, who thoroughly understand the whole business* and the elaborate care and adjustment required for working the *Aperajo* and described by Furse would preclude its use for Indian Military Transport.

Double or divided pads are, however, more satisfactory.

Cháhi Saddle. A new one has been lately introduced called the “*Cháhi*” saddle.

The pads are composed of quilted *numdah* about four inches thick over the weight-bearing surface and fining down to a thickness of two inches at the lower edge.

- The sides and back are further protected by a saddle cloth made of numdah, which is placed underneath the double pad.

The spring and protection offered to the weight-bearing surface by this quantity of numdah should effectually protect the back and sides from galls and bruises.

SECTION XV.

SHOEING OF CAVALRY HORSES.

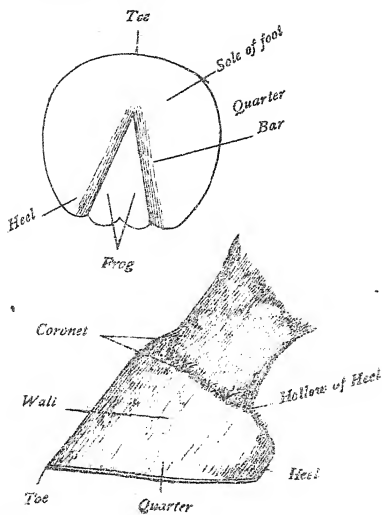
105. Too much care and attention cannot be paid to shoeing, as on it depends the efficiency of the horses of a regiment on service. The ordinary faults found are that horses' toes are too long and heels too high and contracted, as both cause sprains and breakdowns, oftener than is generally supposed. The necessity, therefore, for a good staff of farriers is very great. They should be specially trained either at a Veterinary School or in a British Cavalry regiment. All officers should receive practical instruction in this most important subject, otherwise they cannot carry out their inspections properly.

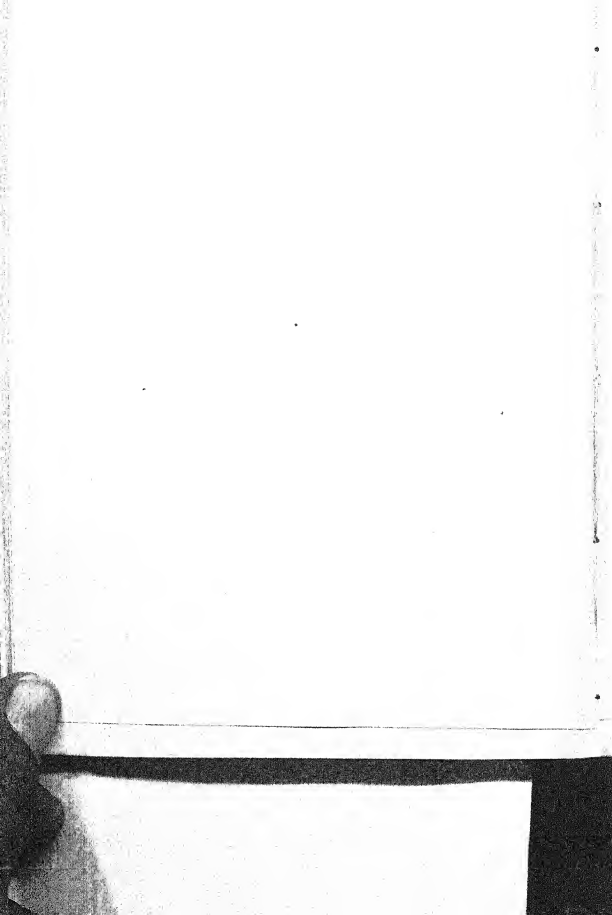
The following short notes on shoeing by Veterinary-Captain Rutherford will be found most useful :—

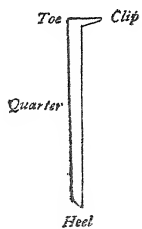
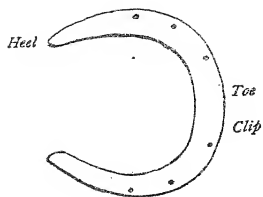
The horn outside the foot is called the "wall" which is continuous with and grows down from the coronet. This growth occupies at the toe nine months (from coronet

Anatomy of Foot.

Ground surface of foot







in front to toe), less at the quarters, and only about four months at the heel.

The wall is covered by a kind of thin skin which should not be removed by rasping or scraping when the horse is shod, as it protects the horn from undue evaporation and so keeps it moist, and pliant, or elastic.

The horn in front of the foot is the thickest of that of the whole foot, but proceeding backwards it becomes thinner at the heels where the horny wall is very thin. There the foot moves out and in to a slight extent when the horse puts weight on the foot, and this is a reason why nails should be fixed to the shoe forward at the toe and quarters and not at the heels—when too near the heels the nails are made to work loose owing to the movement of the heels.

The under surface of the foot is called the “sole,” and is divided into sole of foot and frog—that part lying between the two heels. Where the sole joins the wall on under surface of foot can be seen a line of white horn (the white line). This part is a guide as to where the nails should go, which should never be to the inside of the white line. If they do go there, they are very liable to be too near the fleshy part or inside the foot where they do damage.

The frog is made up of a softer, tougher and more elastic kind of horn than the rest of the hoof, and the bigger it grows the better, as it acts as a buffer to the inside of the foot, and so protects it from injury, besides which it gives a foothold to the horse when going.

A shoe made with a plain bar of iron is called a "road" shoe, a shoe that has a good hollow running round it is called a "fullered" shoe. The "Government" shoe is seated on the ground and is flat next the foot. A half shoe or tip is called a "charlier" shoe.

The width is called the web, a thick shoe is one thick from above to below, the piece of iron on the toe is the clip; as a rule, there is one clip on the fore and two on the hind shoe. A projection on the heel of a shoe is called a "caulkin." The thinner the iron they are made of the better, if compatible with the work and roads (country). For ordinary work a broad web, flat and plain, with six or eight nail holes punched in it is the best. All nail holes need not be occupied by nails: and the nearer they are to the toe and away from the heels the better. The shoe should be of the same thickness from toe to heels; but the heels should be tapered at the inner face and the back portion of each heel should slope downwards and upwards. One clip on each fore shoe and usually two (one on each side of the toe) on hind ones.

Should fit the nail holes exactly and be of the standard size and weight according to size of shoe, *i.e.*, smaller nails for small shoes, etc.

By means of the rasp remove all that horn which has grown down since last shoeing (horses should be shod once a month). Then look at the feet as the horse is standing with all his four feet on level

To prepare the foot for the shoe.

ground to see that both fore feet and both hind feet are of the same length of toe and height of heel, that the front of the wall of the foot is in a line parallel with the front of the pastern, that the quarters of each foot are of the same height and that each heel is about $1\frac{1}{4}$ to $1\frac{1}{2}$ inches high, *i.e.*, from coronet to ground.

After the foot is lowered the rasp should be applied to remove the sharp edge of each foot.

As a rule, it is unnecessary, if horses are regularly and properly shod, to remove any horn from the sole by means of the knife; and the practice of cutting away or paring out the sole and cutting the frog (excepting to remove loose pieces of horn) is bad. The rasp alone is used for lowering the foot so that it will be as strong and thick as possible.

If the sole is pared out with the knife it is made thin and weak, and hence is easily pierced by sharp stones, pieces of wood, glass, etc.; and after a time the foot becomes narrower than it should be and the heels grow close together, the frog becomes small and "thrush" develops in it, as well as "corns" in the heels and a predisposition to develop "navicular" disease. The practice also of cutting away the back part of the heels is to be condemned whether it be to make a shorter shoe fit the foot or otherwise, corns soon follow and the heels grow close together, the foot becomes narrower and thrush follows in the frog.

Another practice to be discountenanced is that of paring the frog too much (removing other than loose horn), the same follows this as cutting out the sole.

First, the shoe (hot or cold) must be no shorter or no longer than the foot, and be made to fit perfectly in this manner :—

Fitting the Shoe.

A place or places for the clip or clips having been cut at the toe just large enough to receive the clip, the outer edge of the shoe should fit the edge of the foot perfectly and the heels of the shoe should go nigh back to the corner of the heels of the foot, the heels of the shoe must not be longer or shorter than the heels of the foot—if the former, the shoe is liable to be trodden upon and pulled off; if the latter, it presses upon the more delicate part of the heels and causes “corns;” if fitted too wide it is liable to hit the opposite foot, fetlock or knee during trotting or galloping, and thus cause injuries called “brushing” and “speedy cutting,” besides it is liable to be trodden upon and pulled off; if fitted too much inside (too narrow compared with width of foot) the horn of the wall in growing projects down over it. If too much horn be cut away to receive the clip when being nailed on, the shoe will slip back towards the heels and the horn of the toe will then project over the front of the shoe. “Dumping”—the practice of rasping the horn of the wall above the shoe—so as to make the foot fit the shoe of course follows, as it also does that of fitting shoes which are too narrow for the feet.

The nails should be driven in so as to come through the wall about $\frac{3}{4}$ th of an inch high, and should be in line; but at the same time it may be better to have the toe nail $\frac{3}{4}$ inch high, the quarter nail a shade less and heel nail a shade less still; but care must then be taken to cause the heel

Nailing on the Shoe.

nail to come out sufficiently high to give a good and sufficient hold of horn, $\frac{1}{2}$ inch will not do.

When driving nails into shoes and feet not provided with clips, some difficulty is experienced in preventing the shoe from slipping into another position not intended. Old nail holes and cracks should be avoided when driving nails into the hoof.

After each nail has been driven, the end which projects through the wall of the hoof is either turned down preparatory to being afterwards removed, or is at once cut off with the pincers, or by being twisted round by the tongue of the hammer.

Tightening (clenching up) the nails.

That end of the nail remaining projecting is "trimmed" by the rasp, and then the end is turned down with the aid of hammer and pincers flat against the hoof-wall. It is unnecessary to cut grooves in the horn to receive the clenches. Now the clip is turned down flat against the wall of the hoof just enough to make it hold, and any nail heads which may happen to project below the shoe should be roughly levelled.

There should not be any rasping or scraping of the hoof after the shoe has been placed on the foot. It is quite unnecessary, and only tends to make feet "brittle;" the rasping away of the natural covering to the horn removes its protecting skin as it were.

This is, though one is at first sight not inclined to think so, a most important point. Removing the Shoe. The "clenches," those points of the nails which are turned down against the hoof, must be most thoroughly cut, not simply turned up or

imperfectly broken. If they be improperly cut so that any sharp edge remains, the hoof-wall becomes torn by that sharp edge when the nail is being withdrawn. This is a common cause of "broken feet."

After the clenches are cut the pincers are inserted between the shoe and hoof, and by a certain movement the shoe is made to rise from the hoof. The shoe may now be driven back on the foot again (which act leaves the nails projecting) and the nails withdrawn separately; or shoe and nails may all be removed at once. Care must be taken that the end of any nail which may have been imperfectly cut with the buffer, is not left in the nail hole—such a piece of nail is very liable to turn the point of a nail being in future driven into the hoof, and so cause serious injury to the foot ("pricked" foot).

Some of the diseases resulting from bad feet and bad shoeing are enumerated below, with their remedies:—

(Stumbling.	Use shoes with turned up toes ; some stumblers go better with rocking shoes.
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Charlier shoes are useful for this.

(Corns.	A corn is a bruise of the fleshy sole at the heel, only found on the forefeet and are most common on the inside heel, caused from galloping on hard ground and short heeled shoes. Feet most liable to corns are flat-looking feet and weak heels. If a simple corn, no fluid or matter will be found in it, colour of corn blue, if not attended to matter forms and may burst at the coronet, in this case it would be called a suppurating corn, there in
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another called "quittor." As a rule, the ordinary shoe with heels beaten out and made broader will do and spring the horn of the foot, plug up hole with tow or cotton soaked in tar, carbolic or phenyle.

Matter is liable to form inside the foot from injuries or prick; this must be let out at ground surface of the foot, otherwise it bursts at the coronet.

Pricked or punctured feet that quittor.

Quittor is the pipe of matter running up the foot.

Is when nails are driven too near the quick, horse becomes lame, is tender all round, foot very hot.

Nail-bound.

Is a crumbling of the horn at the toe or clips, the cause is said to be hammering clips too tight, when deep, it

Seedy Toe causes lameness.

Is a rough dry state of the horn from the coronet to the shoe. It is a scar on the

False quarter

hoof, results from the horse having an injury to the quarter of the hoof.

Take the bearing off the shoe. Shoe, as soon as possible, with rocking shoes or flat ones.

Farriers' Tools and their Uses.

Hammer Is used for driving the nails into the hoof, for fixing the nails tight (clenching), &c.

For withdrawing nails, making the shoe "rise" or "spring" from off the hoof when removing the shoe, and for detecting tenderness in the foot when the horse is lame.

Pincers

Is for lowering the ground (or under) surface of the hoof preparatory to re-applying a shoe; for trimming up the shoe, &c.

Buffer Is used for cutting the clenches (ends of the nails) when taking off the shoes.

Pritchert Is for punching nail holes in the shoes.

Knives. The two knives are called

"Drawing knife" and "searcher"—the former being used for purposes of removing large pieces of horn from the foot when necessary; the latter for cutting small pieces of horn, searching certain parts of the foot when injured, &c.

Rag-stone is used for sharpening the knives.

Apron is for protection to the shoer's knees.

SECTION XVI.

STABLE MANAGEMENT.

The following extracts from the Collinsian First Prize Essay on the "Best method of Stable management of Troop Horses in India," by Veterinary-Colonel Poyser, will be found most useful.

106. The happiest results may be expected to accrue where the stable management is based on common sense, experience, and science; and where there is unity of purpose and action, with a desire and determination

in each administrative and executive agent to do his own duty thoroughly and confine himself to it, there will be little or no cause for complaint.

With this preliminary we start by asserting that stables are essential to the well-being of horses, troop, or otherwise, in India.

This being an incontrovertible fact, reasonable expense should not be spared in designing and constructing buildings that shall at once be suitable, durable, economical (in the long run) readily influenced by sanitary measures, and even portable.

The conversion and improvement of old stables will not be considered here, as individual cases must of necessity be separately met and disposed of.

Many troop horses have been lost to the service temporarily and permanently, from want of protection from inclemencies of weather, climate and insectile annoyance. Our troop horses are only sheltered overhead; they are insufficiently protected from the prejudicial influences of hot, cold, dry or damp winds and draughts, from the sun, drifting rain, and dust. Of course, some troop stables are vastly superior to others, but none are protective enough at all times and under all circumstances: they meet few exigencies of the hot, and fewer of the cold season.

It is argued that exposure, or living in the open inures horses to the hardships of marching and manoeuvre, campaigning and camp life generally; but this argument is almost unsupported, and rendered untenable when we reflect that the above conditions of the

troopers' existence are quite exceptional, and that it would be but feeble policy to direct our actions by events which are *not* the rule.

The more care that is taken—short of pampering—of the horses that are bound to be kept up on a peace establishment, the more prepared will they be when required for opposite emergencies, and the public exchequer will be none the more taxed eventually.

Analogically reasoning, *we* do not lead lives of exposure from choice, nor is it found compatible either with reason, health, or the country's interest to permit our soldiers to do so, just because there is the chance of an annual march or manœuvre, or a campaign once in twenty years: the contrary course is signally observed, and the contingencies and hardships of camp and war are put up with cheerfully enough when they do arise, and endured none the less staunchly. So with our horses. Give them plenty of space and air, adequate shelter and protection, good food and water, and a sufficiency of both, regular and not too little exercise; insist on good grooming and scrupulous cleanliness and sanitation, and then there will be nothing to fear whenever they are called upon to act beyond the ordinary routine of cantonment life.

There are few troop stables and lines that are not overcrowded, and one of their greatest faults is the want of superficial and cubic space. There must be an abundance of both to obviate crowding, than which, with ill-ventilation, nothing militates more against the health and utility of horses, or aids more in filling the hospital. The stables are neither deep enough to afford

protection from sun and rain, nor are they wide enough per stall to ensure comfort. The central passages are too narrow, the roofs of most are too low, and badly or not at all ventilated. The ranges are too near each other, and the entire blocks are in many places so hemmed in by trees, human and other habitations, offices, workshops, saddle and harness rooms, gun sheds, urinals, rears, etc., that ventilation is seriously impeded, and thorough drainage interfered with, thereby favouring the development of diseases and enhancing their dissemination. Several or many of these defects, if not at all, are noticeable wherever British mounted corps are quartered, and they exist in a greater degree in most native cavalry lines.

The close proximity of stables to human dwellings is neither good nor healthy for the occupants of either in any climate or country; and therefore this heedless huddling together of animal life should be studiously avoided, and corrected where existing: for, in India, there should be no feasible excuse of want of ground.

The stable required is one that provides shelter from a tropical sun and monsoon rains: affords ample standing room; admits an abundance of fresh air; mitigates the force of hot winds; subdues the intensity of solar light, and thwarts or prevents the attack and annoyance of flies and other biting or stinging insects; gives speedy and sure exit by its spaciousness and ample ridge ventilation to the products of exhalation and respiration to the foul emanations arising from excrementitious matter, whose decomposition and fermentation are accelerated by the high temperature; whilst it should be so constructed and arranged as to protect the horses

from the cutting winds, draughts and cold of winter (or the cold season). The seasons of the plains of India, for which it is necessary to make these various provisions, are divisible into HOT and COLD, each bringing its own special and inseparable climatic vicissitudes ; for instance, hot, dry, and scorching atmospheric rarefaction with or without wind ; heat and moisture without aërial movement ; a lower temperature with wind often charged with moisture and miasmata,—all conditions more or less oppressive and enervating to animal life. Then we have cold, dry, piercing and searching in its character, cold with dew, fog (to a limited extent in some parts), with or without winds and chilling rain, very cold nights (hottish days) and frost (and occasionally hail) in Upper Bengal, increasing in severity and lasting longer to the northward.

Site.

This for Indian troop stables should be selected on the highest and driest position, out of which there is drainage, and into which there is none : take advantage of natural formations, for though there is an elevation of only two feet above the general level, a solution to the drainage question has, to a very great extent, been gained, and the channel diminished by which many causes arise to interfere with equine health, and general sanitation. Avoid the site of old stables or buildings.

Lacking natural or geographical facilities of elevation, and presuming that other circumstances render it expedient to erect stables, the ground actually concerned should be raised at least two feet, not by excavating or

removing the surrounding or adjacent earth to do so, but by carting it in, from a convenient distance and untainted locality.

Soil.

It should be selected for its firm and adherent properties, which enhance the power to resist permeation. Unfortunately there is not much room for choice in this matter, and that which would be most recommendable is difficult to obtain, the universal nature of the soil of India being *alluvial*, and not fitted for all parts of stable flooring. As a rule, dry soils, whether permeable or impermeable, are healthy; but no soils are absolutely impermeable to water. The less organic matter a soil contains the more healthy will it be. A gravelly or calcareous surface would be a wise selection. A sandy surface without depth, and a clayey subsoil which holds up moisture, would not be a wise one. The cotton-soil of India cannot be recommended. Whatever be the nature of the soil, generally, in the locality, we advise that that intended for the ground work—of both inner and outer stables—should be *prepared* if not procurable; and as some clays are as impermeable to moisture as the hardest rocks, an admixture of clay and sand, in the proportion of one of the former to ten of the latter, would be admirably adapted for flooring, for the addition of even one-twelfth part of clay to sand checks, in an extraordinary degree, the transit of water. There would be no very great obstacle in the way of accomplishing this. Such a mechanical composition will make an excellent flooring material when properly laid, rammed, and allowed to settle before use.

Handy to the site should be a plentiful supply of water ; and, of course, the purer the better. It should always be at such a distance from the stables, other habitations, drains, cesspools, urinals, and the like, as to preclude soakage and contamination therefrom. Of the water-supply we shall speak more fully elsewhere.

Troop stables ought to be within easy access of the men's barracks, though not within three or four hundred yards, the intervening space being as clear as possible. The facilities for or difficulties of drainage, as also the position, quality and quantity of adjacent vegetation, woods, forests or clusters of trees, as well as external ventilation, are to be well considered ; for, to these, most other things ought to be subservient in building Indian troop stables.

As far as drainage is concerned, provision must be made for the escape of surface water, and for that which passes into the soil and subsoil, particularly where the rainfall is heavy. Those portions of the surface on which rain can fall from buildings should be paved or otherwise protected to prevent wear and soakage into the foundations, and water should always be carried off as rapidly as possible. Herbage is always healthy. In India it should be encouraged about all habitations, and kept in check by grazing—not by cheeling ; it prevents the ground becoming hot by obstructing the sun's rays and cools it by aiding evaporation. Nothing is more desirable than to cover, if it be possible (it often is not), the hot sandy plains with closely cut or grazed grass. Avoid brushwood, and, if necessary to build about it, remove it, disturbing the ground as little as can be.

Disposition of Stable Ranges.

If ventilation and sanitation are to be kept in view, the ranges of stables should run *en echelon*. This arrangement being adopted as the best for building barracks, must, on the very same grounds, be regarded as the least objectionable for stables.

Aspect.

There is a difficulty in arriving at a conclusion on this subject that shall not be open to some objection ; but where aspect has not to become subservient to immovable surroundings in the shape of barracks, buildings of sorts, and the geographical formations of the locality, an eastern and western aspect presents the fewest disadvantages ; that is to say, no better plan can be devised than by building stables broadside on to the prevailing, and end on to the deleterious winds, if these blow from opposite quarters. It is here implied that the prevailing winds of a place are *in themselves* healthy, and we believe this is invariably true.

Each range is double and made to hold 40 horses on each side, a spare stall or two being an useful addition.

Each stall to be 15 by 8 feet, exclusive of pillars, to which add six inches more. A centre passage dividing the two rows of horses is seven and a half feet wide, clear and exclusive, whilst a verandah seven and a half feet wide on each side projects beyond the base of the stall.

Roofs.

To be double, the outer of corrugated sheet-iron, galvanized, the inner of varnished wood, pine planking,

or any wood deemed fittest. They will run parallel to each other at an angle of degrees, being separated by a space having a perpendicular of about 20 inches. The inner roof extends from the rear column heads, and ceases at a point drawn upwards from, and perpendicular to the front columns, whilst the outer one terminating (relatively) at the same place, that is, a point higher up the perpendicular,—continues its slopes seven and a half feet beyond the rear columns to form a verandah. An opening, seven and a half feet wide, will be left in each ridge corresponding in width, and being immediately over the central passage.

This opening, which affords ample ventilation from the stable and aerial currency through the inter-roof space, is to be covered by a small (ridged) roof of corrugated galvanized sheet-iron, which will overlap the outer one sufficiently deep to exclude drifting rain, whilst it is raised 18 inches above it.

Saddle, Harness, Grain and Store Room.

Each range is to have its own two saddle or harness rooms at one end, and its grain and store room at the other. The former to be at the ends nearest the barracks so as to be handy for the men getting their saddles, etc., on going to, and leaving them or going from stables. The grain and store room to occupy the opposite ends on each side the passage, like the saddle rooms.

Gutters and launders are not recommended. As they would be useless to carry off monsoon rains, and would only get choked up with dirt and leaves, or by bones dropped on the roof by the birds.

It is argued that galvanized iron roofs become very hot. True, but they become cool as soon as the source of heat is removed, and do not retain and accumulate it for weeks or months like thick layers of mud and tiles, and masonry of sorts.

It may also be said to become very cold, but the inner roof, with the inter-roof space, fairly obviates or modifies the influence of heat and cold on the horses below.

Thatch, if thick enough or if covered with tiles, is perhaps the coolest roof; but neither thatch nor tiles, nor their combination can compete with iron for cleanliness, lightness, strength, durability, economy and protection from fire and climatic causes. Flat or terraced mud roofs are too low, and with or without kunkur admixture conduct heat too freely, and part with it too slowly. Though thatch under tiles is a very cool roof, a reversion of the order of these materials makes a cooler one, but increases the danger of fire, and harbours birds and vermin. Arched or bomb-proof roofs are better than flat roofs if they can be properly ventilated.

Drainage, Floors, and Flooring.

The system of subterraneous drainage is inexpedient for every reason: it engenders nothing but foulness and diseases of a very virulent type; it must never, on any plea, be allowed. Our troop stables in India must of necessity be surface drained, so to speak; but as this is here somewhat anomalously applied, we had better explain that fluid evacuation must either be caught *as it falls* from the horses—practical to a very great extent—or be at once scraped together, with the earth fouled, and removed to the manure-pit without delay.

During the night this cannot be done, but no time should be lost in the early morning, after removing the bedding, in digging or scratching up every particle of soiled earth, and well ramming in fresh, a supply of which should always be kept handy and under cover. An ordinary urine cart should be sent round the stables twice daily, to take away the urine caught. Percolation must be studiously prevented, and the dry-earth system scrupulously carried out in the stable floors. Patent wrought-iron surface gutters are out of the question; first, because there can be no satisfactory outside drainage in communication with them; and, secondly, because we cannot employ any of the useful paving materials as in England, except at an impracticable expense, unless they could be locally manufactured. We are therefore compelled to discard the use of patent non-absorbent bricks with their chamfered edges, grooves and checks, Welsh and Staffordshire Paviers, Dutch clinkers, and granite pitching, and look to the resources of the country for flooring materials, which are absorbent, permeable and percolative. These, of course, are serious disadvantages against which veterinary sanitary science has to contend. Kunkur, which generally occurs in rough irregular modulated pieces, and is an impure calcium carbonate, is occasionally used as a flooring for stables. For this purpose it should, first of all, be reduced to the size of coarse gravel, and might be improved by adding a proportion of cement to assist in concretion and to increase impermeability. It should be exceedingly well rammed whilst drenched with water, and be allowed a fair time to dry. The layer ought to be not less than nine inches thick, and its surface, when finished, ought to be as smooth and

uniform as a stone pavement. It is, however, quite fallacious to employ kunkur alone for stable flooring, for though it can be smoothly faced, its interstices cannot be entirely occluded by ramming : it soon affords ready percolation to urine, and besides, by constantly receiving the fall of that fluid from a height of from three to five feet—usually voided with force, and falling generally in the same place, the kunkur is washed into depressions and unevennesses, which, by and bye, when percolation has been succeeded by saturation, form into reservoirs of fluid filth, giving off poisonous effluvia. The continual movements of a horse in his stall, attrition by stamping or turning, the frequent sweeping by the *syce*, add in no little way to the removal of the finer surface, leaving rough and sharp projections which are injurious to horses when lying down. It may be said that bedding would prevent all this, but if that were constantly used, the horses would be standing on wet and foul grass or straw. There would be considerable waste, floors would never be dry or free from smell, the frogs and feet would never be sound or clean, the permeation would be more diffused, and it is well to remember that bedding is not always procurable.

Again, a kunkured floor to be serviceable must be kept in repair and be repaired with kunkur. The *syce* cannot do this, though it may be expected of him ; it requires special workmen. The *syce* can fill up cavities with ordinary earth and ram it down, but then the character of the floor is at once destroyed.

As the surface of most stations consist of alluvial soil, and as its character is considered to be more or less

malarious, from, we suppose, its holding so much organic matter, it has been argued that kunkur might be advantageously employed as a substratum to flooring of the ordinary local soil—that it may possibly prevent the evolution of malarious vapours from the surface it covers. This, however, is a very feeble argument, because the extent of surface covered would be very trifling. Nevertheless, there is some, though not a sufficiency of evidence to prove that floors substratified or surfaced with kunkur have some influence in preventing the evolution of equine anthrax.

But we are digressing.

If the surface drainage of stable floors has no communication with drainage outside, it will be obvious that an impermeable material, which means an immovable and an uncontrollable one, would be the reverse of good, permitting fluids to spread over more surface than could be properly kept clean and odourless, or to lodge in parts that would never get cleaned at all. Concrete would be more impermeable than kunkur, but more expensive, less enduring, and more difficult to repair; yet, it is not unfavourably reported on in England. And as neither one nor the other can bear the constant weight and attrition of horses' feet for any length of time, it is certain that we cannot find a better material for stable flooring than a soil which is permeable to a limited extent, one which will not allow very rapid percolation, giving time and opportunity, ere fluid soaks below the surface, for its entire removal. Nothing can be more suitable than a clayey and sandy mixture (the proportions of which have been given), which sets hard

and firm after ramming whilst moist, and giving a smooth clean surface under proper manipulation. There is, too, an alluvial deposit called *chikna muttee*, which, when suspended in water and applied to earthen surfaces as a wash, adds much to an appearance of cleanliness, and the natives think not a little to disinfection, for they use it freely to their dwellings, often mixing it with ox-dung, which imparts a faintly green tint to the compound. I believe the term *chikna muttee* means "greasy mud;" it has that feel, and is a sedimentary earth found at the bottom of stagnant water, or where water has been stagnant. As to its disinfecting power I am sceptical, and more so when mixed with ox-dung, however, as a wash to floors and walls it is useful in the hot glaring sunshine of summer, the dull drab colour being more comfortable and less injurious to the horses' eyes than the constant glare of light reflected from white (lime) wash.

Earth flooring should always be well rammed whilst damp, and have ample time, if practicable, to settle; herein consists its serviceability. Though flooring should, for the comfort of horses, be as level as possible, and all slopes as slight as will serve the purpose in view, it is patent that a gentle fall rearwards of about three per cent. is advisable. There should be no other slopes.

Of course, it is the central portions of each stall that chiefly become foul, but all moist and discoloured spots should receive the attention before remarked, and this imposes a duty of constant supervision, but nothing whatever should prevent its strict enforcement. Solid *feces* should never be permitted to lie during the day,

as there are always *syces* about to remove it, for not only the floors, but the feet and general health will suffer by its retention.

On sanitary grounds the earth floors are removed to the depth of 12 inches every six months (or should be) and replaced by fresh soil, and I would add that this is one of the wisest acts of sanitation that has lately been introduced into troop stable management.

I agree with Mr. Collins that floors, impervious to moisture, would be the best; and let us by all means have them if the drainage can be thoroughly accounted for, and Government induced to bear the expense.

To enhance the cleanliness and healthiness of troop stables, we insist on the use of urine vessels, and recommend those of galvanized iron, one to two horses, and to hold about one gallon instead of the present fishglobe-shaped earthen *chutties*, which are easily broken and cannot be kept clean owing to their shape and absorbent properties. For uniformity, easy package and conveyance, they should be tumbler-shaped, so as to nest. They should be daily cleaned with sand and water. Vessels of glazed earthenware each to hold about four gallons, one to four horses, should stand clear of the lines, and into them the caught fluid should be emptied, and they in their turn into the urine cart. Iron scrapers or *koopas*, baskets, and brooms are the only other stable requisites for keeping the floors clean and free from filth.

Ventilation.

The ventilation in and around all troop stables must of necessity be accomplished by *natural* forces, *viz.*,

diffusion, winds, and the difference in weight of masses of air of unequal temperature. Artificial means are inadmissible, even inside the stables, where the temperature of the air is often identical with that outside, and, therefore, more or less stagnant during the absence of wind. To compensate for atmospheric stagnation, it is important to spread the horses over the *widest available area* in tropical climates, excluding all useless and injurious impedimenta to aerial movement, such as massive pillars, division walls and high mud mangers, natives' huts, boundary walls and stacks of grass, etc. Particular attention is drawn to those three italicised words, because their meaning, which only requires pointing out to be appreciated, is so often overlooked.

The very first principle of outside ventilation is carried into effect by disposing the permanent ranges *en echelon*, and this quite irrespective of their aspect : indeed, this is the most simple and effectual arrangement in the hands of the architect and engineer to secure and maintain *general* perfilation.

The use of the *chick* as a controller of the force and volume of the wind, of heat, and cold, cannot be overrated, whilst its convenience and utility, durability and safety, when compared with the clumsy *jhamp* or screen cannot be over-estimated.

There is generally some wind during the hot days, often more than is comfortable, and the *chick*, without entirely arresting its movement, divides its currents into minute streams and mitigates its prejudicial influences on horses, mollifying, at the same time, the intensity and glare of solar light which is so painful to the eyes.

Opened and lined *chicks* alternately arranged round low and narrow hospitals without ridge and roof ventilation, have been found exceedingly useful with a little attention to their regulation according to the weather. And, lastly, they aid materially in protecting horses from the intolerable annoyances and attacks of flies, a serious pest in the early part of the hot season and rains.

Though the bane of troop stable life in India lies mainly and unquestionably in *overcrowding*, (the term is comprehensively used,) there *do* appear to exist some auxiliary and predisposing causes, extrinsic to stable management, at present only blamable to certain peculiarities of locality, to the absence of this or presence of that; but nothing is traced out, nor is the *modus operandi* explainable.

To provide against a scarcity of grass, or the inability to procure it during monsoon or winter rains, regiments and batteries are in the habit of drying and stacking a certain portion daily when abundant. The practice of stacking it *in* the stables (under cover), occupying several stalls at one end, is to be condemned as interfering with ventilation, etc., and increasing the risk of fire

Neither should these stacks be built between the ranges, nor close to each other, for the same reasons, but well away from the lines, and at a safe distance from the forge and other buildings where fire is used.

Trees should not be planted within fifty yards of the permanent stables, for here their shade can be dispensed with; but there is no objection to a single row running down the centre of the outside standings. It is

mal-sanitation to plant trees too close to troop stables, for they interfere considerably with the free circulation of the air, with gaseous diffusion and ventilation in general.

Therefore do not plant trees to obstruct aërial currency, neither allow their foliage to droop, nor their branches to spring out, below ten—better twelve—clear feet.

Branches lower than this are dangerous, if horses, mounted, bolt under them. Though the presence of trees is not absolutely essential, they are not only useful but ornamental: useful to protect from radiant solar heat, from dew and cold, when at any time, or for any reason, it is found expedient to vacate the sheltered stables.

Food and Water Troughs.

Should be made of galvanized wrought-iron, in two compartments. To measure over all about six feet long, one foot wide and nine inches deep; the whole of the top edges to be *inverted* to prevent waste.

Length of the bottom to be less than top by four, and its width by about two inches. The right hand third (*viz.*, two feet) to be partitioned and water-tight for drinking purposes.

The whole to occupy the right six feet of each stall, and to lie flat on the ground in a line with the front columns.

The bottom to be flat, curving only where it runs into sides and ends ; there are to be no awkward angles or corners into which the grain could be pressed out of the convenient reach of the horse, no projections, depressions or perforations. For its inherent strength and durability, as well as for its cleanliness and non-absorbent properties, it is far preferable to the common country *gumlah*, no matter what its shape or whether glazed or not. Earthen *gumlahs* are too small, brittle and absorbent. The most useful ones would be manger-shaped, and glazed inside. But unless set in a mud support, they do not last long, liability to fracture increasing with their size, and circular ones take up more room than can be spared.

The ordinary mud trough, whether a simple depression in or built on the ground, or consisting of a concavity scooped out in the top of a broad wall about twelve inches high, running the whole breadth of the stall, or in whatever way constructed, is not commendable, because of the continual absorption of saliva, nasal discharges, and the juices of the grain (which is invariably moistened before being given) and the tendency to become sour therefrom ; besides a small amount of mud and sand must be taken up with each feed, which, if not actually bad, is not good. We condemn nose-bags of leather and canvas of every shape, because they get hard and unyielding, dirty and sour, invite choking, indigestion and colic, by inducing voracious feeding and bolting of food, are uncomfortable, as they impede respiration ; and are often left on after the feed is finished ; are a source of injury to all sides of the head ; are heavy and

cumbrous and not easily kept clean. Feeding off a blanket spread on the ground is preferable to using *gumlahs*, mud troughs, or nose-bags ; but this is not making a legitimate use of the clothing. We would therefore recommend the use of *feeding-sheets*, to supersede all the ordinary methods, excepting the galvanized iron troughs.

Each horse should have a feeding-sheet made of hempen material, just heavy enough to lie flat on the ground in a moderate wind. It ought to be seamless and strong, but neither fine nor coarse ; about three feet square, and bound on the cut edges. To each corner a strong cord loop should be attached to make it convertible into a sort of forage bag ; or two thinner sheets might be opposed and sewn bag-wise on three sides, and here there is at once an article useful for a variety of purposes. Hides would be too expensive, heavy, hard, unmanageable, and inconvertible. On the single or double feeding-sheet the grain would be thinly spread, and that which fell from a horse's mouth could scarcely fall beyond its edges ; and the few scattered grains would be readily shaken towards the centre, and picked up without mud or sand.

No damage would ensue to it by the horse's feet, nor would they be so likely to be torn as the blankets.

To commend its adoption, the feeding-sheet has cheapness, lightness, strength, durability, cleanliness (for it is easily washed and dried) and general utility ; it is easy of package and carriage, allows the food to be well distributed, ensures feeding from the ground, and cannot be a cause of injury, and is a sure safeguard against choking.

Fastenings, Head and Heel Ropes, etc.

Wooden pegs often do serious damage to horses that have drawn and broken away with them, attached to head or heel ropes, or both. Besides this objection, they split by driving, and are seldom driven in far enough, and in both cases are often known to hurt horses. After heavy rain on the march, where there was no picketing rope, we have seen a stampede of a whole battery's horses.

The picket line would have obviated this, and there is no safer mode of securing lines of horses than by laying down, and tightly stretching, front and rear picketing lines, and fastening them down firmly at regular, but not too long, intervals. To these head and heel ropes can be securely and rapidly attached and as speedily set at liberty. They have the advantage of yielding to a horse's movements, and there would be no possibility of a stampede, though the picket ropes' pegs were drawn. Tethering to be practical, must apply to individual horses as well as to numbers.

In the case of want of space or of rope, horses can be picketed face to face on a single line. A little more interval would be necessary, and each horse must be kept well back by the heel-ropes, and the head rope must not be left very long. This mode, which preserves, as it were, a balance of power, is only advisable as a temporary measure, as a makeshift; it would not be a wise sanitary arrangement; besides, a central division or passage is useful in a dozen ways. Though tying points in permanent stables should be fixtures, we strongly recommend the use of picket lines instead of pegs.

A picket line should be made of the best hemp, four stranded, well, but not too tightly, twisted, from $1\frac{1}{2}$ to 2 inches in diameter, *tarred*, and inter-stranded with slips of red cloth to ensure regularity. Secure it with iron pegs, strong and long, having eyes at the top through which to reeve the rope. A small tackle is a handy instrument to tighten picket-ropes.

Chains.

Both head and heel should be entirely abolished, not only for troop horses, but for mules, as being too heavy, more hurtful, and more liable, from their sheer weight, to twist round a limb, and less amenable to tying and untying than rope; they either jam tightly or easily get loosened; require extra carriage on the march, and breakages call for skilled workmen to repair them, whilst the *syce* can repair a rope.

Head and Heel Ropes.

Should be of hemp, or cotton, which is said to have the preference and not too tightly twisted. A plain strap and buckle should attach the rope to the head-stall, or collar: it is far preferable to a hook and thong, twisted hook, or the notched iron link.

Forefoot fastening by a strap twelve or sixteen inches long is advisable where a horse slips his head-stall or neck-strap habitually. He soon becomes accustomed to it, may pull at it at first, but finds he has very little power, either to break the strap or to draw the peg or other fixture. The plan is a secure one, but it limits a horse's movements too much in stables and in camp. The plan is useful when you are on the "Cabul Scale" of weights.

Head-stalls.

Should be made with movable brow bands to which eye-fringes, of cotton, leather or hempen string, are attached. They fasten by movable throat-straps passing through a loop on the poll-strap and upper ring of the under jaw-strap, to the lower ring of which the head-rope buckles on the left. The loose throat-strap can be used without the head-stall (as a neck-strap) which, for various reasons, often requires to be temporarily discarded.

Head-stalls are frequently made too heavy and clumsy ; all inside edges must be well rounded, or they cut and chafe the parts coming in contact with them, particularly when new. Attention must also be paid to the fitting: where neglected we have seen the lower part of the zygomatic ridge or cheekbone chafed raw. Keep them free from dandruff and perspiration, and soften with grease or animal-oil (not vegetable).

Eye-fringes.

To be independent of the head-stall, and worked into the brow band: they are often needlessly heavy and thick, and interfere too much with vision. Their use is to ward off the attack of flies, and to moderate the intensity of sunlight and heat.

Watering Bridles.

It is important to keep them clean and free from rust, to remove the sharp edges that the rings wear in the soft iron of the mouth-piece. In the hot season

they are not to be hung in the sun, for they become so heated as to make the angles of the mouth tender, and induce sores, which are often difficult to heal at that season.

Condition and Exercise.

Troop horses stand more in need to be in readiness for any demand on their energies than any other large collection of horses. Like the soldier's life, theirs should be brought to, and maintained in, a state of 'ever ready'—without taxing the system or keeping it up to concert pitch,—by regular exercise and training in their own particular work, as they are liable to be suddenly called upon to perform severe and prolonged exertion.

This has been well exemplified during the two recent Afghan campaigns.

Fortunately, perhaps, such opportunities are rarely afforded to test the state and condition of troop horses, but a few forced marches (at the time these notes were penned, *viz.*, 15th July) with the usual concomitants of discomfort, neglect, inexperience, irregularity in feeding; and probably a scarcity of food and water, both of an inferior quality, would reduce the greater number of our Indian troop horses, so engaged, to little better than embarrassing if not immovable impediments. Sufficient attention is not paid to the character and quantity of exercise between the end of one, and the beginning of another drill season.

A week of what may be called sharp work in any part of the hot weather and even in October, would

very much distress any cavalry regiment or battery of artillery, owing to the absence of that state of the organism we term "condition." Of course, a line must be drawn between the condition of troop horses and that of race horses and hunters, or our meaning may not be correctly interpreted. There are degrees of condition, and so marked is the difference that a trooper would be said to be in good working condition, whilst a race horse, presenting identical appearances, would be decidedly out of it from being on the big side.

Condition is cumulative and brought about by *exercise*, that is, work properly directed—a judicious feeding. Troopers in fair working condition at this season (15th July) should have a lively and fresh appearance, a bright sharp eye, a skin that satisfies the sight and touch, that is, looks well and handles well, a short fine glossy coat, muscles firm, prominent, and resisting, spirits hilarious and elastic, respiration free and undistressed by exertion fairly prolonged; the body must not, therefore be burdened with fat, and the depurative functions must be regular and natural. I may be excused for quoting a few pertinent observations on the management of horses by Mr. C. Hunting, an eminent Veterinary-Surgeon in the north of England. He says, "Work must be proportioned to the strength and ability of the horse," but we too frequently, in the Army of India, see that strength and ability and general form are *ill-proportioned* to the work required. "It is evident that a horse only half worked is not an economic machine, and becomes a source of loss when overworked, because the deterioration of the animal is then in excess of the value of his labour. By work the muscular

system is fully developed, by food this state is sustained, and when it reaches its maximum—when the muscles are firmest, when the blood is richest, when every vital organ is most active—we arrive at the point when an animal is capable of doing the greatest amount of work. This state is ‘condition,’ and so long as economy is the chief object, all working horses should be kept at this standard. Above it we cannot go (with impunity) below it we must not go (but we often do). Underfeed and overwork an animal, and he is at once reduced below the point at which he is most powerful, and therefore most economical. The loss and injury caused by overwork does not commonly show itself immediately and suddenly in a form to be detected by a novice; it is the gradual loss of tone and strength, which entails more food, *but no equivalent of work*, and which gradually, but surely, shortens the life and destroys the value of a horse.” The troop horse is often overworked and often underworked from want of special knowledge of the animal, and this is neither surprising nor altogether avoidable, and troopers, at the period before mentioned, are, as a rule “looking well,” and thus they are likely to continue, and will satisfy the most fastidious inspecting eye, so far as appearance goes, until the end of October, and so long as they are only moved or manœuvred occasionally, and then, by fits and starts. But this effect of an apparently excellent management would resolve itself into real impotency under a few successive marches, if a little forced and heavy, under full kits. There would result an astounding number of casualties due to physical unfitness (that want of work engenders) under sustained exertion. An unprepared or “soft” state of the system, is, in such

cases, certain to be followed by chafed and galled shoulders, withers, backs and loins, and injuries by the contact of the sword, shoe pockets, carbine bucket, collar, breastplate, girth, trace and breeching. There would be falls, broken knees, cutting and brushing (the shoes and shoeing unnecessarily blamed); whilst other cases, of a delicate constitution or physique, would the earlier be "off their feed," and suffer from, if not succumb to, premature fatigue, colic and fever, and lose not only their obesity, but the moiety of muscular tonicity they might possess at starting, requiring quite six months' comparative rest and care to bring them round again.

This sort of thing invariably occurs, though, perhaps, less markedly at the beginning of the season, if the work or exercise has not been previously and judiciously increased. One of the objects of route marching, which must be of a steady nature, should materially assist in bringing up condition, and preparing the system to stand successfully against the greater trials of constant drill or marching. Long and smart field days at the beginning of the season, where gradual preparation has been neglected, will often provide the Veterinary-Surgeon with extra work, and the casting committee with subjects for rejection from premature unserviceableness. If troop horses have been *fairly treated and well managed* during the usual drill season, they ought to look and feel fitter on the 15th of October than on the 15th of April, that is, at the close of regular drills, camps-of-exercise, and marching in peace time. There are, however, many circumstances, unavoidable, or uncontrollable, that militate against so desirable a result, and for which allowances must be made.

Marching—but not always at a walk, as some would insist on—is admirable training for troop horses, but experience and supervision should be its inseparable attendants. Pace requires regulating by the general and individual condition at starting; the distance to be travelled, the length of marches, the character of the road, climate, weather, season of the year and the changes likely to occur in them, by the nature of the work on hand, by the weight to be carried or drawn, by the strength and adaptability of the troop horse to the work required of him, and by the scarcity or abundance and quality of forage.

And it is important to discern when horses are jaded or stale, and when rest is desirable. Of course, there is little choice where ordered to be at such a place at such a time, but even here, experience and a special knowledge of the powers and capabilities of the locomotive agency will decidedly triumph over hap-hazard command.

This brings us to the closer consideration of actual exercise, a term implying *active* exertion taken or given to develop and maintain a state of health and condition by which troop horses can execute their military duties and work without premature fatigue, with comfort to themselves, their riders and drivers, and which, when carried further than their ordinary services dictate, brings out the physique of horses to perfection, enabling them to perform and sustain severe and rapid labour and feats of endurance. Grooming is the only useful *passive* exercise that horses can derive any service from, and this subject will hereafter receive its full consideration,

Exercise as applied to troop horses is usually employed in its narrower sense, merely expressing action at a regular and slow pace, and for a very limited period ; for instance, "watering order" which, in the hot season, usually commences at daybreak and terminates one and a half hours after. At most six miles—probably the exception—will be got over, and unless those in charge are alert, the character of the pace will be slovenly. Excepting a few horses required for some particular duty, or for riding-school purposes morning and evening, and not counting a walk of a few yards three or four times a day to water, the rest of the trooper's life is spent in the stables or lines, and he is said to be kept in exercise !

It scarcely suffices to keep his limbs from swelling.

If the early part of the summer be cool, there may be a few field days or Commanding Officers or Adjutants' drills ; but these drop off as soon as sickness, light duty, and removal to sanatoria, have reduced the number of effective men, and when enervation has moderated the zeal of most commandants. With but little change this stereotyped exercise continues till about the middle of October. A gradual increase in its duration, variation of its pace or the site on which it is taken should be thought of and adopted earlier than is customary, or we lose the opportunity of slowly but surely lessening fatty accumulation of the body generally, disburdening the heart and respiratory organs, reducing the volume of the abdomen and its viscera, developing the muscles, and—this is most important—hardening, so to speak, the skin that must soon bear rougher usage from the chafing and pressure of harness and saddlery.

During these long six months of idleness and *ennui*, there has probably been neither change nor reduction, of any moment, in the food; and *presuming* the regulated allowances are sufficient for the cold and working season, we must naturally conclude that the horses are getting too much food during the hot and lazy season; consequently there must either be a waste of food now, or the cold weather feeding is insufficient: we hold the former opinion, though both cases may furnish individual examples.

Hunting remarks, "Good food must accompany good work; neither must be disproportionate. What is excess of work for one horse is not for another. What is excess of food for one horse may be not enough for another." And more to the point. "The food required by a horse doing moderate work is sufficient for the same horse doing hard work." But on a large scale, too much time and supervision would be required to proportion the food to the work in individual cases. It might, however, be managed. At the same time the system of feeding in its entirety must be a general one in the case of troop horses, to be considered practical. And the same argument applies with equal significance to exercise and work.

With the advent of October come very perceptible climatic changes and thermal variation; high temperature during the day, invigorating mornings and evenings, with a degree of cold that makes a blanket necessary. Activity breaks out in all military operations, in anticipation of inspections, marching, and camps-of-exercise, as well for general instruction and special training. And thus the troop horse enters

upon increased labour inadequately prepared—at a disadvantage. A tax is thrown too suddenly on all organs previously weakened by idleness and heat, and, perhaps, over-feeding. Profuse perspiration follows, and the skin easily chafes and galls; condition—no obesity subsides, and harness and saddlery cease to fit in consequence; the weaker animals rapidly fall away, and their systems become so damaged that the normal strength and tone may not be recovered for months, and these bodily exhaustions render them prone to disease, to sprains, falls, cutting and brushing, and the like.

The digestive organs fail in the performance of their functions; an overdraught of water rapidly swallowed, a feed of grain hastily bolted, induces colic; fatigue, partially and temporarily paralysing muscular fibre, of one or both orders of the bladder and its sphincter, results in retention of urine, whilst constipation, impaction and colic often supervene on that condition of the muscular tissue of the intestines.

Nutrition suffers by want of exercise: organs lessen in size and activity, and become abnormal; over-exertion produces similar conditions; but the happy medium, where work is proportioned to the quantity and quality of food received, to the constitution and climate, secures that state of the animal body which is capable of sustaining the greatest amount of work, and resisting causes inimical to health, soundness and service ability.

Every organ has its special stimulus which excites its action, and if this stimulus is perfectly normal in character and amount, and exercise being neither insufficient nor excessive, perfect health and condition are necessarily the results.

Troop horses, then in India, do not get enough exercise out of the drill season. Certainly, we enjoin rest, or rather relaxation after the winter's work, but from the 15th July (particularly where the monsoons prevail) they should have not less than two hours' daily exercise, increased to three and over by the middle of October. At any rate from ten to twelve miles should be daily got over (Sunday excepted) if the weather be not unfavourable as regards rain. Walking exercise should be smart, trotting, when advisable, steady and slow, and these alternating with "light marching order," and light manœuvring, will constitute the usual means to condition troopers. And if one's personal experiences are not delusive, the British horse soldier would be none the worse in health and physique for a little more exercise than he voluntarily indulges in, in the hot weather, though not very advisable during his first season. Farriers, shoeing-smiths, and rough riders are the hardest-worked men in a regiment.

Inactivity is a great error in India, but times should be selected for the taking of exercise, and the sun avoided as much as possible by both men and horses. There will of course be some difficulty in giving as much as three hours' exercise to the troop horses, on account of the present system of nursing and caring for the men. It is only our duty to note what we think is best, and leave the arrangement thereof to others. I see no objection whatever to robbing the evening stable hour of thirty minutes, and substituting two or two and a half miles' smart walking, after which half-an-hour's brisk strapping would do the horses more good than a whole hour's careless, indifferent, listless, and *pseudo*

labour, into which the grooming of the syce and soldier (in India) degenerates.

Experience, drawn from the close observance of horses training for the turf, demonstrates that about four hours' fast walking exercise daily (twice) is essential, unless other, faster, and stronger work is being given, to maintain health and promote condition on a liberal allowance of food. By making this sort of comparison, we do not wish to be misunderstood. The trooper differs vastly from the race horse; does not require, and would not stand, the same training. His class, however, ought to look better than it often does, on the food and under the care it is supposed to get; at least, there ought not to be that unaccountable (?) difference between the horses of one troop or battery, and those of another, living or believed to be living, under the same régime, and in the same station. Where dissimilarity exists, and it is often seen and often heard of, rest assured defective stable management has been, and is at the root of it, unnoticeable or hidden though it may be.

If it is the result of regular work or judicious exercise it is preferable to see troop horses "lighter" at the end of the hot season than is usual, and by this is meant less fat, and with more muscular tonicity and altogether in firmer working trim.

Remounts join from the dépôts at from four and a half to seven years old, and are, as a rule, in fair order or condition, or developed, if they have been there any length of time, by liberal feeding and self-taken exercise in the paddocks. Some, however, are

overburdened with fat, which is a poor material to begin training upon in the riding-school.

If they join at the beginning of the cold season—and have not suffered by the marching—their training can generally commence at once, and proceed uninterrupted, barring accident, to completion. But if they join at the close of the cold season, their training must be closely watched by the Veterinary-Surgeon, lest the Riding School Establishment should, in its anxiety to finish their education, overlook the fact that remounts are the very horses least able, at this time, to bear the chafing of accoutrements, the superimposed weight, and draught, or any exercise which, though not severe, may be comparatively straining or constraining on an animal hitherto accustomed to move and gallop about freely, unweighed and unconstrained. Stud bred will bear the exercise in training better than walers, which easily sicken from extra exertion and exposure to the sun, and suffer from fever with hepatic complications. Lasting debility is a frequent result of this fever, and it is astonishing how rapidly some will fall away under its influence.

The exercise, or rather the training work, of young Australian horses, must be conducted with judgment, and its amount and character stopped, reduced, or altered, where the weakness, loss of condition, liveliness, and general health, are observed. They cannot stand much work during the first summer in India, in fact, though they may have been in the country a year, they are still unacclimatised. The coarser breeds—the usual article in the army—do not stand either the work or

climate as well as the finer breed of horses. They require much care and warmth during the first winter, more especially in camp and when marching.

The training exercise of remounts must not be carried to a fatiguing extent, or the results will be "brushing," "cutting" and falls, which not only disfigure the horses, but delay and throw them back in their work.

Exercising on small circles is objectionable, as it is cramping to the action of the limbs. Exercising always on the same ground is jading.

Mounted exercise should often be given to the troopers independently, to keep up the habit that they acquired or should have acquired during their school days, of leaving the ranks at once, when called upon to proceed alone.

All exercise under a trot should be at a fast walk; the horses to be fairly in hand; the men riding at easy attention. The effect of "lolling" in the saddle is well recognised. The route should frequently be changed and the pace occasionally. The ordinary exercise in the hot season should always commence at, if not before, daybreak—this being the coolest period. Without encroaching upon the subject of winter drills, it is the Veterinary-Surgeon's duty to mark their effects upon the horses, and offer timely advice whenever he sees it required.

Syces should never be allowed to ride horses to and from watering order, or on any exercise, or on the march, without the interposition of a numdah or folded blanket

between the points of contact, for the syce's stern is a well-known source of injury to the horses' backs. Badly-stuffed pads on the body-rollers, when put on too tight, have the same injurious effect on the horses' spines. There is a practice in the artillery of allowing syces to ride troop horses, saddled or not, on orderly duty, and they may frequently be seen pounding along the middle of metalled road, in Gilpin-like fashion.

This is neither work nor exercise, and should be dis-
countenanced.

Grooming.

It is scarcely needful to adduce argument to prove that grooming is necessary: everybody will admit it to be a most essential part of stable management; inseparable from cleanliness and healthy existence under domestication, and indispensable to the well-being of troop or other horses.

The nature of their domestication, the nutritious character of their feeding, and their work, pre-eminently demand that grooming shall be perfectly performed. Its neglect total, or partial, is very soon recognised, by accumulations of the desquamatory and other products of the cutaneous secretions, which, if not regularly and frequently removed, check the action of the glands of the skin, and indirectly affect organs vicarious to it, predisposing it to parasitic and other diseases. There will be an unthrifty appearance, the coat will be dull, dirty, long and fast when it ought to be shedding. When the animal becomes warm from work and freely perspires, the cutaneous odours will be very disagreeable; the skin

becomes irritable, and disfigurement ensues from rubbing. Proper grooming promotes health, it is invigorating and the horse enjoys it as much as his master does his "tub." It is more important in India than in temperate climates, for the action of the skin cannot be checked for a moment with impunity. On the contrary, the activity, and completeness of its function should be encouraged; it being the most important emunctory of the body, at any rate in the hot season. From his knowledge of the anatomical structure and physiological function of the skin, the professional man sees the important necessity for dermal cleanliness, whilst the amateur comes to the same conclusion regardless of these reasons, but quite aware from custom and observation that grooming and cleanliness must ever precede and accompany health. If the matter be left entirely in the hands of the men and syces, grooming will not be properly done; much supervision is imperative, and must never be relaxed during the stable hour. Laxity in grooming, and inattention to the feet (frogs in particular) on the part of those performing, and those set to superintend it, ought seldom to go unpunished. I speak neither rashly nor unadvisedly, because it is the bounden duty of those concerned to do it, or see it done well, and each should be taught to regard his duty as his "bread and butter."

Instruction in grooming to recruits should be reduced to a system, as almost all acts of manual labour are in the service. Many times have I seen recruits sent to groom animals they scarcely know by sight, and, verily, without kits: they neither know how to go about a horse, nor how to handle him, yet their escapes from accidents

are marvellous. Non-commissioned officers might take more pains to teach the recruit a duty which is with difficulty picked up accidentally and unassisted; judging from the very loose and careless manner in which they *inspect* and *pass* horses brought before them as "groomed," I am quite satisfied that but few understand the art theoretically or practically: this is neither severe nor exaggerative. It is a fact applying to all branches of our mounted army. Old soldiers and syces, naturally, take advantage of the ignorance or neglect of their immediate superiors.

The necessity for grooming increases as work becomes harder, faster, or more protracted, as the quantity and quality of food increase, and as the climate becomes more tropical.

Horses in India lose their fine summer coats about October; their winter coats are fairly set by the end of November, and those in their turn, nature, if she has been well assisted by art (grooming), will have removed by the beginning of April, sooner or later, influenced by season, latitude and many other agencies.

Where semi-starvation and general neglect in everything connected with decent stable management have been the order of the day,—I have a gigantic case in point—the old coats will remain fast in patches, that is, in parts which are a little difficult to get at with the brush, and be difficult to remove. As remarked previously, troop horses should commence their exercise and drill as near to the break of day as can be in the hot season and be groomed on their return, by which arrangement they get the benefit of the

coolest part of the day and are cleaned exactly at the time they require it, and when it does them the most good, viz., *after exercise*.

If wanted for an inspection or a drill that is ordered to turn out half-an-hour after dawn, let them have as much grooming as the time will admit of, but if not required for what may be termed "eye service," let the grooming be subservient to exercise. Such should be the usual morning routine from about the 1st of May to the 30th September, when the nights (and early mornings) will be chilly enough for a light blanket after gun fire. Of course this is not so in all our military stations. From about the first of November, and earlier in some places when drills and military duties can be carried on much as they are in England, so far as time is concerned troop horses should not be stripped too early for grooming, if possible, not before the sun is 'well up,' and the chilliness is out of the air; indeed, at this time, exercise before grooming is the more commendable in India, because our troop stables, unlike English ones, are open and shed-like, and the inner and outer temperature almost identical, cold, chilling and keenly felt by the horses when first unclothed. Again, in England, where the trooper is not clothed, this subject has no weight or influence on the time that grooming should take place. Private owners would do well to put a stop to the system of grooming long before daylight in both the hot and cold season. It may not be generally known that syces compel the grass-cutters to clean the stable, to remove the clothing, and to dress the horses almost in the small hours to save themselves labour, and give them an extra sleep. Punish any recurrences after

forbidding the practice which disturbs the horse's rest, unsettles and chills and in other ways harasses him : besides, it prevents the grass-cutter going out for grass as early as he should. There is nothing gained either in appearance or condition by stripping the Indian troop horses too early in the morning ; on the contrary, there will be a loss of both. Let the avoidance of the practice be the rule. If it is compulsory to strip him, let the blanket be thrown over him as soon as he is saddled or harnessed, and kept so until the "turn-out" sounds. We will now suppose our troopers have come in pretty warm from drill, riding-school, or exercise of some sort. It is customary to water them on their way into the stables or lines, and experience proves that this practice is not bad, if we may judge from the comparative absence of colic or other disturbances to the system, after it : but, to be allowed to drink *ad libitum* at this period irrespective of the animal's systematic or physical fatigue, or degree of heat, or of the coldness of the water and atmosphere, cannot be considered advisable. A small allowance of water, when the body is heated and fatigued, is refreshing and good : and a fair, if not a satiating quantity, under ordinary circumstances, is not prejudicial at this time, which is a convenient opportunity to give it. Nevertheless the practice of watering horses when perfectly cool is undoubtedly the safest and best, and this should be arranged not less than fifteen minutes before feeding with grain. When a horse comes in from work or exercise, no time should be lost before the process of grooming commences, and if he is very hot, it will be advisable to leave the saddle on, or otherwise cover the back until it can be attended to. If saturated with perspiration, he should be scraped and

dried as quickly as possible, being, at the same time protected as much as can be, from the influence of cold and drought, which, by causing rapid evaporation, is liable to bring about "chills" and fever or more serious affections.

In wet weather a blanket should be thrown lightly over him whilst his extremities are being cleaned and dried. If the legs and feet *are* wet and muddy, there is no objection to using water to both, so long as immediate and thorough drying be ensured. If this all-important point cannot be attained—half measures are useless—use no water, dry at once, brush clean and well hand-rub afterwards. Experience proves that it is unwise to issue orders or make suggestions to the men or syces that call for the exercise of their common sense: they must be made in a form which admits of no deviation, or misconstruction, and therefore it is found expedient in practice to disallow the use of water to the legs and feet. This is to be regretted, because it might often be employed with so much benefit. However, it is better to accept that which is productive of the least evil.

Feet, and frogs especially, if good and sound, are easily maintained so without the aid of water, yet it harms neither the one nor the other when properly used. .

Though we are bold enough to assert that bad frogs need not exist in troop stables, there are always some to be found, and water cleanses such the easiest and best, and, after drying, prepares the way for the good influence of any medical appliances that may be prescribed.

If there is to be a total absence of bad frogs, the Veterinary-Surgeon would be required to live almost entirely in the stables. (I know that from long experience.) Farriers are expected to attend to these signs of bad stable management, which should never be allowed to arise. The man to whom the horse belongs, and his supervising non-commissioned officer, are not held sufficiently responsible, in fact, few of them show by results that they know when a horse's frogs are sound or clean. The condition in which stable floors are usually kept has something to say in this matter.

And if we would not shirk a duty, it is incumbent on us to say that officers of, or intend for, mounted corps, would find it very much to their advantage to understand the thorough constitution of stable management, and to possess some idea of the habits and requirements, in domestication and health, of the animal that Government entrusts to their charge, and to be able to recognise, and, if need be, to administer to his common ailments.

I am sure most young officers, and many old ones would only be too willing to devote themselves to the acquirement of that useful knowledge which is, or should be, so intimately associated with the pleasures and duties of their private and professional life. Government would do well to institute special courses under competent and well-paid instructors, who would impart more practical information in three months than could be intuitively gleaned in a lifetime. A little knowledge here might upset the old adage, we hope, and be less dangerous than the possession of none.

Reverting to our subject : loose fragments of horn and those forming packets and grooves about the frogs should always be removed, because they hold the dirt and moisture of the stable floor, which cause destruction of the newly-formed horn, but care and discretion must be exercised, and needless cutting avoided, then, by thorough, regular and frequent washing and perfect drying, with the aid of pressure, most diseased frogs can be cured, unassisted by such agents as tar, which is generally plastered in them and on the feet concealing that which requires exposing, and by its adhesive property, retaining sand and dirt. Stockholm tar is a very useful antiseptic remedy, and is proof against moisture, but should be sparingly used by those who have been instructed as to its application. Its lavish and indiscriminate use is to be discountenanced, as it destroys and rots the horn.

The use of cow-dung, oleaginous and blacking mixtures, soft soap, grease and tar and other abominations, which by repeated applications form thick layers of filth difficult to remove, should be entirely disallowed. Nothing looks better than a clean natural hoof, if it has not been altered in shape or mutilated by the knife and rasp. Tarry and greasy *compos* are often employed to temporarily conceal the marks of the rasp, which ought never to be seen scored into the enamel of the hoof.

Whether water is or is not used the feet must always be carefully picked out, and all grit and stones removed with a blunt pointed picker. A sharp pointed one, roughly used, will easily scratch or cut through moist horn or frogs not well protected by it (horn).

The picker served out to the dragoon is too short and too curved, and in some feet is entirely useless. The men are in the habit of leaving their pickers in their room; a very casual inspection of the feet shows whether they have been used or not. Every time a man is found without his picker during "stables" he should be provided with another at his own expense.

I have known this to improve the faculty of memory.

There is no objection to a damp cloth being used to the hoof, if it is not plastered with mud, which careful washing the easier removes. If the hoof is scrubbed with mud on it, the protecting enamel becomes destroyed and the hoof injured.

Loose, broken or shifted shoes, lost nails, raised clinches, exfoliating frog or sole horn and broken (hoof) walls, must be duly reported; and be rectified by the shoeing artificers, who should refer to the Veterinary Surgeon what they do not understand, after inspecting the feet (once a day) at the stable hour succeeding exercise or drill. But as this time is the cooler part of the morning in the hot-weather, it is better for the farriers to select some other opportunity during the day to make good those defects, so that their work at the forge fires shall cease as early as possible.

It is not proposed to detail every act or course that goes to make the sum total of the art of grooming, but we will give a sketch of it. A horse should be thoroughly dried by rubbers and wisps before the brush is applied. Scrape, if requisite, first. Hard dirt is best removed with a strong grass-bristled brush,—not supplied to the

army. When quite dried the brush should be freely and smartly used to every part of the skin, upwards, downwards, backwards, forwards and circuitously, and be applied not only with the strength of the arm, but with the weight of the body thrown on it. A couple of brisk rubs on the currycombs now and then clear the brush of the dandruff, which when collected in it should be *knocked out* on the floor in the *rear* of the horse and *in one place* and not *blown out* into the air, as is the custom of syces, just where they happen to be standing. The reasons for this are obvious enough.

Damp hand-rubbing assists materially in removing the coat when shedding commences. The ears, eyes, nostrils, muzzle, sheath, dock, etc., should be well and carefully cleaned with a wet sponge. Damp or dry wiping, damp or dry cloth, glove, wash leather or bare arm friction, are admirable adjuncts after the skin is thoroughly cleaned in restoring tone after fatigue, promoting health, and producing a glossy, sleek, and an even coat.

Hand and arm shampooing have a very beneficial effect on the horse's skin and coat, but it is a speciality of the Indian syce only.

The head, mane, and tail are usually the last parts groomed, and they require more time bestowed upon them than is the rule.

Hand-rubbing of the legs is a good *finale* so long as it is not continued while the horse is eating his grain. This is a plan adopted by some, and it is no means a commendable one, because then a horse ought

to be left as quiet as possible, for very little excites him at feeding time, and invites the habit of "bolting" or wasting his grain.

Hand-rubbing is especially useful where there is a tendency to oedematous swelling of the legs, or puffiness of the joints; bandages too, carefully and evenly applied, serve a similar end.

Manes and tails should be well brushed from the hair roots, lock by lock, from below upwards, and finished off by good general downward brushing. The long hairs of the ears, jaws, and heels can be occasionally pulled out, and if by one's or two's, the process of depilation is not cruel, and their removal adds very much to the appearance of the coarser-bred trooper who in no way suffers by the loss. Eyelashes, whiskers, and feelers should not be cut or plucked out, and main combs never allowed.

Every troop horse's penis should be withdrawn once a week in the hot weather, and twice a month in the cold, and with the sheath, well washed, with soap, and water, which will prevent flies attacking these parts, and by removing the preputial and glandular secretions and concretions, will reduce the cases of retention of urine. An ordinary grooming kit should consist of an oval-shaped, hog-bristled brush, currycomb (which must never be used to the horse's skin, for its purpose is to clean the brush only), two large dusters and rubbers, one hoof-picker, wash leather, one sponge, a piece of brown soap, a bag to put them in, and a galvanized iron bucket, we should like to include a water and a dirt brush, but the carriage of these things is a

great drawback to their adoption. Hay wisps are easily and quickly made and should always lie handy for use, and be neatly and smoothly plaited.

The practice of washing horses all over is not in itself pernicious; on the contrary, at selected times, it is undoubtedly refreshing, but must be condemned *in toto* in Indian and other troop stable management, because thorough and immediate drying cannot be regarded as certain sequences. Besides, horses do not require washing, except to serve some special purpose and even here, complete arrangements must be made to guard against ill effects, such as "chills," by clothing and rapid friction.

Troop horses should never be washed, except such a course is medically necessary.

Halting, as well as grooming, in winds, should be carefully avoided during perspiration, and the syce who attempts to dry his heated or washed charge in the sun, or with the aid of towels or blankets used as punkhas, a frequent dodge in private stables to save trouble—should either be dismissed on the spot, or meet with a tangible reward if it re-occurs after due admonition.

Erythema or "mud fever" is here unknown, but cracked heels from the same cause are not unfrequent in the winter months.

Troop horses, in England, whose legs are covered with mud, will take little harm if left alone to dry, whilst the men eat their dinners, provided the horses stand out of wind or draught, and as they often do

return from route marching, etc., at this particular, and I may say unfortunate, time, experience proves that it is better to let the mud dry on and be brushed off afterwards than to wash the legs, and leave them wet or only half-dried. On such occasions, the horses should be attended to first, and the men's stomachs subsequently. At the beginning of the cold weather the troopers' tails should be neatly cut and squared, but not too short, to give them an air of smartness and regularity. After this they should not be again cut till the return of October. Of course, in the hot season the longer the tail the better to keep off flies. Short-tailed horses may have a peice of cloth attached to the caudal extremity to act as a fly-flapper in the stable. Horses inclined to rub tails and manes should be prevented by tying them so that they cannot reach any obstacle; thorns may be tied on to the rear pillars.

Shoeing scarcely comes under the domain of these articles; it is entirely in the hands of the Veterinary Surgeon (and his subordinates) who will see that it is efficiently carried out, by frequent inspections of everything and of everybody connected with the work.

Harness and saddle cleaning are not intrinsic part of stable management; therefore, beyond observing that too much attention cannot be paid to the fitting of this gear as condition improves or falls away, or as its pad-dings and stuffings harden and consolidate, we have nothing to say.

Clipping.

It will, doubtless, sound somewhat strange to those who have never served in India to hear the practice of

clipping troop horses advocated : but it has for some years taken an important standing in stable management, though, until recently, chiefly in private establishments, and in parts where the cold weather is comparatively long and severe. I have for many years adopted it with the best results ; and, long before the practice received either official recommendation or sanction, noted unmistakable benefit accrue where it was put in force amongst the troop horses of a battery of Royal Horse Artillery on the march, in camp and on manœuvre. These horses were picketed in the open during the coldest part of the year for about three months, six weeks of which they passed on the higher and exposed ground about Roorkee (Camp-of-Exercise, 1873-74). They were not only subjected to unusual cold, but to hard work, irregular feeding, and to early turning out, and late return to lines.

Excepting the legs from knees and hocks downward they were clipped all over about mid-November when the winter coat had fairly set, and if needful, again towards the end of December or beginning of January, but not much later, so that the new coat would not be interfered with.

It will be found that clipping only once during the season is not sufficient for some horses, notably the coarse and under-bred Australian geldings. These, if not twice clipped, look extremely ragged and stubby about the beginning of March. Some of the well-bred geldings from the old studs and many of the mares require no clipping. As with entires all they want is good grooming to improve their appearance and add to their comfort.

The subjects for clipping require selection. Innovations in stable management do not readily take root; they are often either nipped in the bud without a trial, or choked by that luxuriant and indigenous weed called "dustoor," before a trial can possibly take effect: it is really astonishing that clipping was not adopted in Indian troop stables soon after the invention of the machine which has entirely supplanted the old-fashioned comb and scissors; the practice was established on the recommendation of Mr. F. F. Collins, P.V.S., we believe, several years ago, and must have required long and lucid representation before it was regarded as practically advantageous to the Indian Trooper. "Better late than never;" its adoption only requires extension to prove its worth. When once the hair of heavy-coated horses becomes saturated with perspiration or rain, they are not only difficult to dry, but very liable to take cold when heated by exercise, if left standing uncovered or unattended to.

Excepting the lower half of the legs in the less hairy horses, and a saddle patch on those whose backs have been needlessly and injuriously branded in the studs with the largest of type, they should be clipped all over. To compensate for the loss of their natural clothing, it is advisable to increase the artificial one, though they do not seem to take much harm under the amount usually allowed. They should never be without clothing except for work and grooming. Clipping to many horses is equivalent to about one-fifth of a daily ration of grain. Clipped troop horses seldom perspire profusely; if they do, the skin and short coat dry almost immediately, without labour, and without risk of taking

cold, because there is nothing to hold and retain moisture, the evaporation of which produces chilliness. A long thick coat affords no more protection against rain than a short one; its presence is disadvantageous: but in a dry cold atmosphere or wind, it is protective so long as its wearer does not perspire.

The objects in clipping are; *1st*, to place the trooper in a more convenient and comfortable position to accomplish his daily labour; *2nd*, to improve his physical condition, and increase his powers of work; *3rd*, to reduce his liability to contract certain diseases; *4th*, to smarten his appearance; *5th*, to lessen the labour of grooming and to promote cleanliness and thereby health; and *6th*, to act as an adjunctive remedy in the treatment of certain affections.

There can be no objections to clipping troopers so long as the clothing is forthcoming when wanted, and herein its carriage on the march, etc., is implied. About this, in peace time, there is no difficulty: in war time—by far the shorter epoch—clip and clothe, or clothe without clipping: it is purely a matter of adaptation to circumstances. The Afghan expedition should settle the point.

Horses, with long coats returning to their stables or lines late in the evening, (as is the case sometimes in camps-of-exercise,) heated, and sweating, are placed at a greater disadvantage, and put to more discomfort than the shorn horses which are easily dried and quickly groomed.

I have observed that catarrhal affections are in no way whatever increased by clipping: that it is eminently adapted for anæmic horses which thicken and fill out on the same feeding and under the same clothing.

On the practice of clipping, Professor Williams, F.R.C.V.S., says: "It is a great advantage; horses work better after it, thrive on less food, are less liable to disease, are stronger, healthier and more cheerful, and, when sick, recover in a much shorter time."

Singeing does not commend itself: it is far less satisfactory, difficult of application in open stables, and dangerous, and altogether less practicable.

Clothing.

For about half the year, more or less, in Bengal, the North-West Provinces, Punjab, Oudh and other parts and Presidencies of India, it is essential that the horses should be kept warm by clothing, more especially when they are clipped.

Each horse is allowed a pair of blankets or rugs, aggregating, when new, about 16 pounds. The black or grey country blanket, 14 feet by 6 feet, makes a very serviceable clothing. By having two blankets, the amount of clothing can be regulated according to temperature and other circumstances. If standing in the open during rain, one rug only should be worn, the other ought to be kept dry to replace the wet one immediately the rain ceases.

When required to protect the spine from solar rays, a folded blanket should extend from shoulder to tail: the more folds the better. We, however, recommend the adoption of the hempen rug—now in common use

in England—lined with good country blanketing, large enough to encircle the chest and fasten there by a buckle and strap. If made to fit the withers, back and croup, with deep sides, it will, of course, be warmer and more serviceable than square unfitted clothing, which hangs loosely hollow, and irregularly about the horse. Besides this one ordinary blanket should be allowed. These would suffice for clipped horses, and a heavy or light covering would be at hand as weather and position indicated. The outer hempen cover, easily supplied by the country, when well and closely made and firmly bound, is very strong and durable. This is the description of article supplied to bullocks and mules, but a better material is desirable. Clothing wants frequent inspection, and should be rejected when thin. Nothing more is required, but a broad country-made ROLLER and PAD which should fasten with two straps and buckles. The thong fastening is a bad arrangement, as too great a purchase can be got on the roller, and when put on too lightly, often injures the back, besides rendering the horse uncomfortable. The pads seldom accomplish that which they are intended to, *viz.*, to keep the spine clear of pressure: they demand frequent attention, and re-stuffing. It is often necessary to remove both roller and pad to allow the injured backs to recover.

The temperature of the nights in India require watching, and it is the Veterinary Surgeon's duty to suggest what clothing should be worn or removed. It is the better plan to begin clothing early enough and before the cold weather decidedly declares its presence, and it should be gradually relinquished as the hot weather approaches. Clothing requires frequent brush-

ing and well shaking twice a day, to free it from dirt and dandriff.

Bedding.

The straw of the cereals being of considerable value as a cattle forage, is, therefore, not employed for bedding purposes. Rice-straw is sometimes used by private horse-keepers, and horses do not care to eat it. For troop horses, bedding generally consists of long, coarse grass, which grows rapidly during the rains, and is brought in by the grass-cutters, but never in sufficient quantities to properly protect the limbs—hocks in particular—and prominent parts from chafing and contusions on the ground. By this, almost every trooper may be seen to be permanently blemished by an elliptically-shaped scar or roughness on the outside of each hock, in a part which during recumbency and when the joint is flexed, becomes prominent, but which in the standing posture forms a concavity. Capped elbows and hocks, chafed fetlocks and bruised hips, are prevalent where there is a scarcity of bedding. In very dry seasons it cannot be obtained, and even in very favourable seasons, there is not much to be seen about some troop stables: for I can call to mind an instance of over 400 horses that have hardly had a blade of bedding under them for two years: and the result is not so bad as might be expected. There should be a daily issue of, at least, six seers per horse which, if sanctioned, would, no doubt, be readily supplied. At certain seasons bedding is difficult to keep, for the sun dries and renders it very brittle and easily pulverised: the wind, if at all strong, blows it about; and horses consume a good deal. Syces burn it in winter, to warm themselves, and in

summer it is made into small heaps with stable refuse, and lit to smoulder to windward of the horses, to assist in keeping off the tormenting attack of flies by its pungent smoke.

After removal every morning, it should be well shaken, picked, cleaned, dried, ventilated and placed in thinly-spread squares, well away from the horses and stables. It is not long since we observed that it was the practice of a battery to stack the bedding under the very noses of the horses in the outside lines. On the march, bedding is out of the question. River-sand is a comfortable bedding in closed stables in hot weather, but of no use in the open. Besides it allows the urine to percolate too rapidly, and gives it too much time to soak into the flooring proper below. It soon taints and is, on sanitary grounds, objectionable, unless its frequent change could be depended upon.

Water and Watering.

The supply of water must be good, abundant and always handy to the horses, though its source ought to be as far away from the stables and other habitations as to preclude contamination by soakage, drainage or sewage from their occupants, or by the ablutions of the natives, their clothes or other people's; and if it is brought from a distance, it should be free from the same objections: its aqueducts, if they are likely to pass through the neighbourhood of bazaars, villages or cities, should be securely covered and trapped at intervals for ventilation, examinations, cleansing or repairs.

Wells of various depths are the usual, and perhaps the best, sources of drinking water in the plains, if they

are protected from surface drainage and subsoil soakage, are deep and lined with cemented masonry. These reservoirs should be kept clear of all dead vegetable and animal matter: the foliage from trees growing over and about should be prevented falling in, for its influence can be no other than pollutive. The more regularly and thoroughly wells are worked the better and purer will the water be. The mouth of a well should always be higher than its margin : and if not naturally so, a cone-shaped construction over its mouth (which may be considerably reduced) affords a capital provision against the return of water soiled on its brink, or the inflow of surface washings: with these precautions water must of necessity find its way into the well by percolation, which, if deep enough, is a filtering and purifying process. Parkes says: "Shallow well water is always to be viewed with suspicion: it is the natural point to which the drainage of a good deal of surrounding land tends, and heavy rains will often wash many substances into it." Dr. Cameron, of Dublin, cites a case where good and bad water were obtained from different levels in the same well.

The Rivers' Pollution Commission give the following table to show the comparative value of spring, river, and well water as sources of supply :—

Wholesome	1. Spring water	{	Very palatable.
	2. Deep well water		
	3. Upland surface water	{	Moderately palatable.
Suspicious	4. Stored rain water		
	5. Surface water from cultivated land	{	Palatable.
	6. River water to which sewage gains access		
Dangerous	7. Shallow well water	}	

Parkes enumerates the general characters of good water to be perfect clearness, freedom from odour or taste, coolness, good aëration, and a certain degree of softness.

Tank water, unless it has a constant in and out flow, as well as all stagnant water, should generally be avoided, more especially near bazaars, villages, and graveyards. In camp, or on the march, if the horses are watered at a running stream, select a point *above* the camp, village or city.

In the cold season, and on ordinary occasions, three times per diem is sufficient, but inadequate in the hot season, when horses should be watered, at least, four times daily. It is advisable to allow an interval of from ten to fifteen minutes to elapse between watering and feeding. Horses standing as our troopers do, to all intents and purposes, in the open, drink very little water in the early morning; indeed, refuse it in the cold weather, and show but little avidity for it until after exercise in the hot weather.

At this thirsty season they drink most at the evening (4 to 5) watering, which is rather a favourite time for the occurrence of colic. As horses naturally drink more in the hot months, so water should be offered to them the more frequently. The fresh or dry condition of the grass, the moistened, soaked, or dry state of the grain, each regulates the amount of water a horse will drink. Whole gram soaked to saturation takes up its own weight of water: hence a horse eating four seers (weighed dry) thus prepared, will, as a matter of course, have taken in eight pounds or one gallon of water, and

it is justly argued that he will require that much less by drinking.

If horses are tolerably cool, or better, not very hot, on returning from drill or exercise, there is no harm in allowing a reasonable amount of water, before entering their stables or lines. If very heated, it is better delayed till they are cooled and dried. Say, in half-an-hour. Cold water, provided the quantity is limited, will no more hurt a heated horse than will iced water a heated person. Of this latter fact there is hourly experience in India.

When exercise or drills are late, say, nine or ten, water before the breakfast feed. Horses are exceedingly eager for water between nine and ten at night in the hot weather, and on occasions it has been found an admirable practice to adopt. A glance at the usual régime shows a degree of inconsistency in the times, and number of times of watering, which, however, is not of such consequence in the cold as the hot season. Between 8 A.M. and 5 P.M. (*nine hours*) troopers are watered three times. From 5 P.M. to 8 A.M. (*fifteen hours*) they get no water at all. Of course, the difference between the day and night temperatures and the absence of exercise during the night must be considered, at the same time something would be gained if those fifteen hours could be reduced to twelve.

Extra trouble would be entailed by watering late in the hot nights, but if each horse had his own bucket, it could be filled before the close of evening stables, and stand ready to be given at certain time by one or two

men (native sentries) per troop. Horses should not be allowed to suffer from thirst; restrict their water and they will soon look tucked up, and lose condition and spirit. "Washy" horses and special cases require restriction.

The giving of the grain feed immediately after watering is looked upon as an unwise proceeding; yet we are not inclined to separate the one from the other by so long an interval as some. Nevertheless it will be advisable to err on the right side, and be guided by the dictates of experience. I recommend that the feed be not given under from 10 to 15 minutes after watering. As a guide for the hot season, from about the 1st of May, the following table of times for watering and feeding may be accepted as practicable and adaptable:—

Water.	Grain.	Grass.	REMARKS.
A.M. 7 to 7-15 ...	Réveillé * and 7-30.	Divide	* The whole of the daily grain ration to be divided into four, the first portion of which will be given, half at Réveillé and half at 7-30.
A.M. 11-30 to 11-45	12 noon	into four	
P.M. 4 to 4-15 ...	4-30	equal	
P.M. 7 to 7-15 ...	7-30	parts.	

Of course, this régime cannot be a permanent one; it will be modified by circumstances and the gradual alterations of season, but it gives a line.

Food and Feeding.

The dieting of troop horses has been, is, and always will remain, a source of controversy: each method or system has had its own cycle, advocates, and supporters: one plan finding favour now, another coming into fashion then; the whole thing often resolving itself, as many others do in the service, into "a matter of opinion."

The following table gives a fairly correct idea of the constituents of a series of foods:—

	Water.	Woody fibre.	Starch, gum, sugar, and fat.	Nitrogenous matter.	Ash or saline.
Beans or peas ...	14.5	10.0	46.0	.26	3.5
Cooltee ...	12.03	...	61.58	23.27	3.19
Gram ...	11.39	..	66.92	22.70	2.60
Barley ...	13.2	13.7	56.8	.13	3.3
Oats ...	11.8	20.8	.52	12.5	3.0
Maize ...	13.5	5.0	67.8	12.29	1.24
Hay ...	14.0	34.0	43.0	5.0	5.0
Carrots ...	85.7	3.0	9.0	1.5	0.8
		(Gelatine)			
Flesh ...	47.0	3.0	3.0	20.0	...

The chief columns to notice here are those showing the proportions of flesh-forming and heat-forming materials; but we must not lose sight of the others, which in some cases considerably affect the value of a food. The large amount of water present in carrots

and beef increases the comparative proportions of the other articles, all of which are in a dried state. Again, the column showing the amount of woody fibre is important, as this article is indigestible, and therefore almost useless as food.

The most important point, however, in the table is this, that each substance differs in composition: some containing a large percentage of fatty or starchy matters, others containing a heavier proportion of nitrogenous matter. This theoretically suggests that some foods are most suitable for the production of muscle, others for the production of fat; and experience fully confirms the correctness of this indication.

Both chemistry and physiology, then suggest that more than one kind of grain is advisable, if we aim at economy and high condition. But the full economy of mixed feeding is only seen, when we consider the money value of the different articles of provender in relation to their nutritive constituents; that is, when we compare the feeding value with the cost of the articles. When, then, we understand the chemical, physiological, and monetary value of foods, we are in a position to select the cheapest and best food; or rather, I should say, we are able to select those articles of food which, when mixed in proper proportions, afford the largest amount of feeding material at the smallest possible cost. Thus, and thus only, is the highest feeding compatible with the strictest economy.

Grass.

Forty pounds of fresh grass, if good and free from sand and earth, and the water which is either used to

wash it, or to make it weigh heavily, or thirty pounds of the same, well beaten, cleared of earthy and vegetable impurities, and dried in the sun, are both quite sufficient for the daily support of troop horse, provided, of course, he receives his full ration of grain, plenty of water, and is not overworked.

The description of grass most common on the alluvial surface of India is called *doob*—an excellent forage grass; and as it takes very deep root it will throw up its feathery shoots above comparatively dry and sandy soils, and where other kinds would hold no existence. Even its roots are succulent and nourishing when fresh from under the soil. In Bangalore they speak of two crops of grass and one of roots per annum. *Doob* grass spreads rapidly and in every direction with the slightest rainfall, striking downwards its fibrous roots from every knot that lies contiguous to the surface. Its deep and strong roots resemble underground stems or stalks, whilst the superficial ones are fibrous, like those of most graminacæ. It attains a good height, flowers and seeds, and makes a fine class of hay when cut and well harvested at the proper season. In the plains I know of nothing natural corresponding to English herbage: the verdure of the country is chiefly due to this luxuriant forage grass which is a very pretty specimen, sustaining in its nature, and much liked by the herbivora.

Clover grows in some parts of Afghanistan.

There are a great number of other useful grasses, which, when cut and properly preserved, make a splendid mixture of upland-like hay (but *minus* the herbage).

I append the local names of specimens collected, and most of which may be found growing together with the *doob* preponderating.

I regret being unable to make anything like a botanical classification; for practical purposes, however, a qualitative one will suffice:—

EDIBLE AND GOOD GRASSES.

- | | | |
|-----------------------------|----|--|
| 1. <i>Doob</i> . | | |
| 2. <i>Siwaree</i> | .. | } Similar to <i>doob</i> and often found mixed with the trooper's forage grass. |
| 3. <i>Jergre</i> | .. | |
| 4. <i>Budree</i> | .. | Resembles a meadow foxtail. |
| 5. <i>Ayea</i> | .. | } Sorts of canary grasses. |
| 6. <i>Seuwee</i> | .. | |
| 7. <i>Seenok</i> | .. | } A kind of meadow fescul. |
| 8. <i>Jansewa</i> | .. | |
| 9. <i>Unjana</i> | .. | A sort of crested dogtail. |
| 10. <i>Small Phoolerrie</i> | .. | } A kind of cross between reed-sweet grass, meadow smooth grass and trembling grass. |
| 11. <i>Large Phoolerrie</i> | .. | |

RANKER GRASSES, and more suitable for cattle:—

- (1) Burrl or Burwalla; (2) Khodilee; (3) Motha; (4) Gurrur; (5) Kurmukkurrur.

Rush grasses :— 1, Kass; 2, Burwee; 3, Koos, Kansa, or Dáb; 4, Surput or Phoos is a 'bedding' grass.

Lemon-grass (*Andropogus citratus*) is found in some localities, but horses do not much care for it.

The flower or head of the *doob* grass is often attacked by the epiphyte, *uredo, segetum*, which reduces the ear to a black mass of sooty powder.

We must, however, regard the *doob* grass as the staple forage grass on this side of India, in the plains. As just remarked, it sends downwards and outwards strong thick stem-like roots as well as its tuft-like fibrous ones, and is in this way very binding to light sandy and alluvial soils. It springs to the surface with very little moisture and flourishes when and where other specimens die down.

After beating and picking, dry it well in the sun.

The stomach of the horse being small, suggests either feeding in small quantities and comparatively often, in the stable, or the slower process of grazing. Troop horses should not only be *watered* four times daily, but *fed* with grass and grain four times a day at least. It will entail a little more trouble and supervision, but will save the life of many a horse.

Now it is well known that horses deprived of sufficiency of grass, or hay will not only lose condition, and that rounded state of the abdomen, the reverse of "tucked up," but health and spirits, which cannot be re-established under from four to twelve months. I have seen it occur where grass has been scarce, coarse, rooty and dirty, also after long marches and camps-of-exercise, as well as where none of these conditions existed, but where others did that ought not to.

Horses require bulk as well as quality, and an excess of grain will not supply the animal economy with that which should be supplied by fresh or dried grass. The *faeces* of horses fed on grain and a deficiency of grass becomes tenacious, poultaceous, and not unlike stiff porridge or boiled linseed meal, and the stench is

unbearable, and more like that arising from the excrement of carnivora. This is not an unfrequent condition in camps-of-exercise, where the work has been heavy, the time for feeding limited and the intervals between the grass feed too long.

Feeding and Food.—Grain Forage.

If our choice were limited to a single kind of grain, oats would certainly be the best as in England, for troop horses; but in India, they are not a staple grain, and cannot be grown in sufficient quantities to meet the demand. "Experience has proved, and science explains it, that oats contain in better balanced proportions the essential constituents of food, and in a more digestible state than any other kind of grain. But we find that there is a degree of work sometimes exacted from horses (not troopers) which oats are not able to meet, but which can be met by means of well-selected mixture of grain." We can, however, dispense with the discussion of oats as a grain forage for troopers. Given with crushed gram, or with that and crushed barley, an excellent mixture is furnished, and if *properly prepared* by crushing, no better feeding compound can be given to horses that are called upon to accomplish hard-and-fast work.

We do not agree with the mixture that is given to troopers, irrespective of season and work, in many stations of India, *viz.*, $\frac{3}{4}$ grain and $\frac{1}{4}$ bran, more especially where the latter is made up of wheaten bran of an inferior quality, and often containing a third of barley and rice husks, and a variety of filth.

Gram (*Cicer arietinum*) has been given from time immemorial as a feeding grain prepared in various ways, and has been regarded as very suitable for troop horses. Once, it had cheapness to recommend it: now it is one of the dearest grains in the market; and, as before remarked, Government persists in feeding its horses on it, whilst by mixing with barley, and improving the diet thereby a reduction of about 25 per cent. would be established. This is a loss to the public purse. Gram alone is very liable to produce and keep up an irritable condition of the bowels, if given over moderation, when the stench from the *faeces* is abominably offensive. One-third gram and two-thirds barely, *well crushed*, alternating with half gram and half barley, and with two-thirds gram and one-third barley, are admirable feeding proportions, the one or the other being regulated in its administration by work and season. There is no particular reason (unless that of convenience) to stand perpetually by one rate of proportion. Attention is drawn to the emphasized words "well crushed," as the proper preparation of barley is more important than that of any other grain, except cooltee; nay, it is essential.

Before being accepted for the use of the service, it should be well cleaned of grit, earth, and extraneous seeds.

If horses received their ration by measure, a large quantity of weevil-eaten grains would affect their allowance; but by wheat, there is little or nothing lost.

A handful, when taken up and shaken, soon declares its character; and if hollow, betrays itself by the husky rattle: the holes and the weevil are easily seen: the

cavity inside an eaten grain is generally larger than the outer puncture and usually contains the grub, and some dusty debris.

Gram not carefully stored during the moussoons undergoes a change which brings small white spots through the husk and on to its surface. They appear like spots of mildew, but are not of that nature when seen under the microscope: in all probability they are nothing but starchy efflorescences. At this time the grain is soft and can easily be cut open with the thumb nail, not so in May and June, when it is difficult to crack it with the teeth. It, like all grains, absorbs moisture, toughens and sounds dull in damp weather: it soaks readily and quickly, and the higher the temperature the faster will it take up water.

A good sample in dry weather should have a sharp clear rattle like that of tiny pebbles and be full and unshrunk, and tolerably regular in size and color; which latter should be of a chocolate or brown shade. Most samples contain a number of paler seeds, varying from that of a light brown to a pea green. Though shrivelled these grains are not bad, and the color does not prove them to be new seeds.

If diminutive and shrunk they are of little worth being innutritious and indigestible. When dry, it splits sharply in the mill, and when very damp is tough and does not. It should sink at once in water. All floating grains are hollow, or otherwise bad. Some grains alter in composition, become black outside, hard and very bitter tasted. Their appearance can easily be detected, and, though they sink in water, unlike good grain, they fail to soften.

There are various ways of preparing gram for feeding purposes: indeed fashion has its sway in this as in most other things.

No. 1. Soaked whole for a number of hours,—a longer time being required to saturate it in cold than in hot weather; it occupies more than double its original space, and weighs as much again.

Two hours are quite sufficient to thoroughly soak it in the hot season, but we often notice that it is steeped for over 12 and 14 hours. Of course this is unnecessary, though not actually injurious so long as the gram is entire. On the contrary, split gram turns sour by undergoing acetic fermentation, if steeped for that time when it is not considered fit for food. If the water is in excess, soaking deprives the gram of a certain amount of nourishment; this water should not be thrown away, but given to the thin horses.

Though this prolonged soaking renders the gram physically soft, it neither makes it squashy to the taste (one is rather surprised at the dryness it conveys) nor does it produce what is termed "soft condition."

No. 2. Split and soaked for an hour before feeding.

No. 3. Split and given in a dry state.

No. 4. Split and moistened just before giving.

It is seldom given whole and dry,—never to troopers in cantonment—and being a very hard grain, it should always be broken finer than mere splitting, unless it is soaked in its entirety.

No. I system makes an excellent preparation for rapidly improving the condition of horses that have been reduced by hard work or insufficiency of food, or both. This was particularly exemplified in a large number of horses that once came under my charge. They had been overworked, and received for a long time a short allowance of exceedingly bad and indigestible grass, had been robbed of some of their grain, and not meeting with that care, management and supervision that they should have had, the majority fell away to little more than skeletons, especially those of upwards of 13 years of age.

Here was an instance of systematic debility requiring careful hygienic and dietetic treatment to restore health and condition. Their digestive and assimilative organs failed in performing their functions properly, and they, with every other organ and tissue, suffered more or less in consequence. It was in this class of case that soaked whole gram showed itself so eminently useful and recuperative. It was well prepared for mastication (though *post mortem* examinations show that large quantities are bolted whole) for stomachic and intestinal digestion, and ultimately, for absorption, and thus, in this instance, the soaking increased its adaptability, for the operation of a set of organs weakened both structurally and functionally. Though there can be no doubt as to its being a preparation on which horses can live, thrive, and work, we regard it not so much in the light of a natural food, as an artificially alterative one, by which property it aids nature to regain convalescence, health and condition.

In dismissing the discussion of gram, we may deduce, that gram *alone*, no matter how prepared, is not a very

suitable grain for troop horses; it is not improved by the addition of an inferior quality of bran, such is as usually furnished by the Commissariat Department: if gram *must* be given alone, let it be well broken up and simply moistened with water just before feeding and mixed with a little finely chopped hay or grass.

Barley.

Like gram this is a staple grain in India, procurable almost everywhere, and used extensively for horse feeding. In some stations it is the only grain obtainable at a reasonable cost; for instance, the more northern parts of the Punjab administration, where barley forms the chief portion or whole of the troopers' grain forage, and as such it is excellent, provided the sample be good and it is *well crushed*. It should be sound, hard, short, stout, heavy and thinly husked. Damp and mould sample, long, thin seeds with a preponderance of husk, must be rejected; and also that adulterated with injurious seeds, sand, mud, and stones. It is not very liable to insectile attack, but the blue mould fungus is said to attack its inner coat. Uncrushed, unground raw barley is both difficult to masticate and digest, and in this state has frequently caused immense dietetic disturbance and death; it will pass out undigested to an unsuspected extent. Even when ground by the ordinary "chukki" or stone hand-mill—in the imperfect manner generally seen in Regiments and Batteries—we have practically demonstrated, at much labour, that one seer in five is the average daily waste. Roasting facilitates the grinding and tends to give a more satisfactory digestive result, but it is not always practicable. It is not

advisable to give roasted barley unground or uncrushed. Time, trouble, and expense are involved in proportion as preparatory processes increase. We are not in favour of grinding—do not mistake the term—because, as usually conducted, it only tears some grains into several pieces and allow a large quantity of whole ones to pass through untouched. If there must result no waste from grinding, great care and supervision are called for. The country hand-mill is too light to do it rapidly and effectually, and unless the grinders are watched they hurry the process and limit the grinding power of the stones by separating their surfaces, by means of a washer of leather, cloth or cotton, fixed round the base of the pivot of the lower stone, or by other methods.

Thousands and thousands of tons of grain, chiefly barley, but including gram and Indian-corn, have been wasted in Afghanistan during the recent operations there, by troop horses, mules, *oxen* and *camels*, in consequence of its being given uncrushed. The waste and loss, by its passage out of the system in a whole state, has been immense.

New barley is highly nutritious, and contains a large amount of nitrogenous (muscle-forming) material, and even when given alone, if of good quality and *well prepared*, is a first-class food for Indian troop horses, as well as others. Half gram and half barley is an excellent mixture for cold weather feeding, and two-thirds barley and one-third gram for hot weather. Presuming all are good, the best training food we know of *as the general feed* consists of one-third each of gram, oats and barley, with an occasional variation in the proportions, each slightly preponderating in turn. They must all be

prepared by crushing, and this can only be properly accomplished by passing them between the smooth wrought-iron wheels of machinery; no other method brings these grains into so thorough and fit a form for feeding purposes. Of course, the pressure of the wheels requires regulating for each description of grain; 25 per cent. can be saved by using the machinery alluded to either by steam, horse, bullock, water or hand power. By the slower process of hand power a couple of syces are able to work easily and satisfactorily a little machine made by Messrs. Turner, Ipswich, and known as their "Model Corn and Seed Crusher," No. 11, weighing (box, pedestal and all included) 166lbs. It packs for transport *into* the box pedestal and fixes *on* to it for use. It will break up (as coarsely or as finely as desired) about six maunds of gram per hour and four or five of barley, with two or three pairs of syces to work it. Barley and oats are crushed into tiny wafers or scales, and being only flattened—not ground—no flour is wasted, and not a single grain escapes uncrushed. The same class of machinery on a larger scale may be more useful and rapid in execution, but certainly not more satisfactory in result, or handy for transport. I have known one of these little machines crush barley and gram for 178 horses daily for over twelve months, so effectual and expeditious was its action and power. Syces, who have a great objection to touch the ordinary mill-stones, willingly work these machines, and, as they are most simply constructed, require but little understanding. There is no danger of their getting out of order under ordinary care; there are neither cog-wheels nor ribbed rollers to go wrong. In the crushing of barley they will save nine pies per maund to the battery or troop

commander. Thus it will be seen that not only does this kind of machinery quickly pay for itself, but, as it were, increases the daily ration of every horse nearly 2lbs. Cattle feeders and milk sellers are so well aware of the amount of waste grain that is found in horse (troop) manure (where barley is used) that they either wind-sift the dry droppings or feed their cattle on the fresh ones.

Soaking cannot be applied satisfactorily to barley.

Bran.

Is one article when pure, and another when issued by the Commissariat of India. It is, however, difficult to procure in the quantities now required for troop horses, viz., one-fourth of the grain ration, and therefore, are as much as told to put up with the adulterated stuff tendered. I argue that it is much better to give a substitute that one knows will do a horse good, than to give bran like this which can do him no good, but probably harm.

Bran when pure is an excellent alterative food, a gentle laxative, incomparable as an adjunct to a low diet, useful in sickness, convalescence, obesity, plethora and inaction, but it is not a fitting food alone or in the proportion of one-fourth the ration, one-eighth would be preferable, except under special circumstances.

SECTION XVII.

VETERINARY INSTRUCTION.

107. Every officer and as many men as possible should be put through an elementary course of veterinary instruction so as to get some knowledge of the ordinary diseases of horses, their symptoms and simple remedies, and to be able to act on an emergency without professional assistance.

An excellent book for ready reference and most suitable for field service, as it is so small and light, is "Indian Horse Notes" by Major C; from which the following extracts will be useful and should be remembered by all ranks :—

External and Local Diseases.

Disease and probable cause.	Symptoms.	Treatment.
Hide bound—from bad keep or deranged stomach, or result of long illness.	Skin firm and immovable on body.	Good grooming and diet, and steady but not severe exercise. Bran-mashes for supper, and green food (carrots, lucerne, or guineagrass, &c.,) daily in small quantities. Warm clothing. Stable well ventilated. If costive, give aloë ball

Disease and probable cause.	Symptoms.	Treatment.
Swelled legs—(Lymphangitis), from hard work and debility, or from no work and want of exercise.	Swelling, usually of one hind leg only, goes downwards: generally preceded by loss of appetite and fever fit.	as described in "Remedies." An alterative, consisting of two parts of sulphur, two parts nitre and one part black antimony, may be safely given mixed in the food for ten days. Don't blister or fire, but hand-rub and apply warm fomentations and flannel bandages. Attend to diet and exercise gently. If from debility, give tonics.
Strain of suspensory ligaments, which run down each side of the legs, from hard work specially galloping. <i>Note.</i> —These ligaments are not elastic like the back sinews.	Local swelling and tenderness, leg usually is kept bent, with toe only touching the ground. The animal limps if trotted.	Dip the leg every hour in a bucket of cold water, instead of bandaging it, until swelling has subsided. Keep in loose stall for three or four months, and then only give walking exercise for another three months, when a cure may perhaps be effected.
Strain of the back sinews or of the sheath covering them.	Same as above, but the fetlock will probably be bent forward more than it was before. Trotting will apparently lessen the lameness temporarily.	Apply cold water bandages of chamois leather for a fortnight, put on high heeled shoe, give cooling diet and mild aperients. When heat and tenderness have gone blister the spot effected.

Diseases and probable cause.	Symptoms.	Treatment.
Cracked heels or chapped heels, from damp feet, usually groom's carelessness in not drying them.	Cracks of skin on back of pastern, with watery discharge, which sometimes smells nasty.	If slight, apply marigold ointment. If inflamed, first apply carrot and charcoal poultice (see "Remedies"), followed by chloride of zinc ointment, or apply a mixture of one part of Goulard's Extract and four parts glycerine cream or oil. Preventive is fresh butter or glycerine rubbed on heel half an hour before exercise.
Grease, generally groom's fault as above but occasionally it is constitutional. White heels most liable to this.	Cracked heels in aggravated form with foetid discharge. Local swelling, with moist and greasy skin.	Treat as above for bad cracked heels. The poultices must be continued till all inflammation has gone. Also give mild tonic internally.
Sanderack, from brittleness of hoof and hard trotting or concussion.	A crack down the hoof, usually on inner side, and quite sudden.	Clean crack, with sponge, dry thoroughly. With file or hot iron make small nick below (and above also if possible) the crack to stop it. Rub in hoplemuroma, bind hoof tightly with cord or tape or an artificial clasp, if one can be obtained. Apply coronet ointment to accelerate fresh horn. Work must be light, but rest is best.

Disease and probable cause.	Symptoms.	Treatment.
Contraction, from bad shoeing cutting away bars on sole, or natural deformity.	Foot too oblong, and heels closed together. A hollow at quarters (<i>i.e.</i> side of hoof) is a very bad symptom.	Watch shoeing carefully. Sole to be thinned, heels lowered. Shoe must fit properly with only 2 or even 1 nail on inner side and 3 on outer side. Bars and frog must not be cut away. Shoeing with tips only (to be removed and replaced twice as often as ordinary shoes) for a few months is desirable.
Thrush, from contraction, want of exercise, wet feet, and neglect.	Slight lameness and tenderness when exercised. Deep cleft in frog, which has foetid smell and emits slight discharge.	Cut away loose horn, insert hoplemuroma or tar with plug of hemp. If very bad, first poultice. Keep foot dry and clean, let frog grow, and use bar shoe for a month.
Corns from bad shoeing or injury from a pebble, or concussion.	Lameness. Reddish spot on sole in the angle between bars and outer wall of hoof. Horse flinches when the spot is pressed.	Remove shoe, poultice, then pare away corn gently, and apply hoplemuroma or chloride of zinc. Use a bar shoe for two months, with cavity opposite the corn.

Internal Diseases.

Disease and probable cause.	Symptoms.	Treatment.
Fever, from chill, exposure, high feeding or accompanying local pain or inflammation.	Suddenly shivers. nose clammy, ears and legs cold. Second stage—skin hot, and dry, lassitude, off feed, pulse and breathing quick. Subsequent weakness.	At once put on warm clothing and flannel leg bandages. Steam head and give hot mash. 10 to 20 drops of tincture of aconite is a safe sedative, or give two drachms of nitre every two hours in hot wash. Sponge head and body with vinegar and water occasionally. Keep stable cool. After fever is over, give tonics. If a horse won't eat nitre in a mash, two ounces of sweet spirits of nitre in half a pint of water can be given instead, or a ball made of one drachm of camphor with two drachms of nitre.
Catarrh, or Common cold, from sudden change of temperature or chill.	Same as fever, but has also cough, brown discharge from nose, and running from eyes. Sneezing fits often occur before catarrh and should not be	Same as above first day. Steam head repeatedly. stop gram, give hot mashes and green food only. Plenty of water to drink, with the chill off it. If constipated, enema of warm water. Purgatives are dangerous.

Disease and probable cause.	Symptoms.	Treatment.
<p>Colic (Spasmodic) from bad food, or chill, or drinking well water (i.e. hard). Sometimes no assignable cause.</p> <p><i>Note.</i>—Take care not to mistake laminitis or enteritis for colic. In laminitis hoof of foot effected is hot. In enteritis pain is not intermittent, and the belly is both hot and tender. With stallions, scrotal hernia is often mistaken for colic, as described in "Accidents and Injuries."</p>	<p>neglected. Immediate steaming of the head may avert the catarrh.</p> <p>No fever or other preliminary symptoms (if horse passes urine it is not colic). The horse stamps and constantly looks at and even bites his sides and belly, which is not hot or tender and pressure of the hand on it seems to give relief. The face is haggard and anxious nostrils and lips drawn back. Pain is not constant, but gripes are sudden, violent, and intermittent, when horse drops down and rolls on his back if he can. If body is sweaty, it is a very bad case.</p>	<p>A smart canter, with immediate rubbing down at first sight of a cold will often stop it at once.</p> <p>Immediate action necessary, or guts get entangled from griping, and horse must die. Rub belly and sides hard by hand and exercise if possible. Back-rake and give colic clyster (1 pint turpentine in 2 quarts hot soapsuds) at once or if you can't get it, give warm water enema. Give camphor ball (1½ drachms) at once repeating every half hour till gripes stop. If camphor not at hand, give quart of beer warm with 2 glasses whisky and one ounce powdered ginger in it. Keep body warm, and afterwards give mashies. For various colic medicines see "Prescriptions." 1½ ounces chlorodyne in a pint of oil (linseed or olive) may be given on first symptoms if no-</p>

Disease and probable cause.	Symptoms.	Treatment.
Colic (Flatulent), from drinking too soon after feeding or eating moist green food.	Same as above, but belly also swells and is hard. Delirium often occurs. Eye is dull and sleepy; pulse feeble. Extrimities are cold.	<p>thing else is available. The homœopathic remedy is 12 drops of nuxvomica on a bit of bread.</p> <p>Give drench of—</p> <p>Linseed oil 12 oz Tincture of opium 1 " Turpentine 2 " Or 2 to 4 drachms of chloride of lime in a quart of tepid water.</p> <p>Hand rubbing backracking, clysters, clothing and diet as above.</p>
Diarrhœa, from unwhole some diet or hard riding, or debility.	Purges in small quantities at every movement feverish.	<p>Give 4 lbs. dry bran mixed with food daily, rice water instead of cold water to drink and keep warmly clothed.</p> <p>Avoid aloes. If very bad give once a day an ounce of tincture of opium in pint of rice water as a drench, or 2 drachms of catechu. Work should be moderate.</p>
Lampas, indigestion, or cutting of the teeth.	Palate swollen, so that horse can't feed properly.	Cooling diet generally sufficient. If not, make three slight cuts with penknife down palate. Never use a hot iron for this.

Accidents and Injuries.

May be slight, only hair scraped off when loose folds of wet linen will be sufficient; bad Broken Knees. when blood is seen; or very bad when the synovial glands are cut, and a glary yellowish transparent fluid comes out besides blood.

First remove all dirt by squeezing sponge soaked with water (warm, if immediately available, is best, but better use cold Treatment. than wait) above the wound so as not to touch the injured parts with sponge. If the synovial gland is not cut, dab the knee gently with sponge four or five times a day for five minutes at a time, with a wash compound of three drachms carbolic acid to a quart of lukewarm water.

If a horse with broken knees lies down, he will, in bending his legs, constantly re-open the wound, therefore either sling him, or tie up his head so that he cannot lie down. His head should be towards the stable entrance to avoid turning him round each time his knees are attended to.

If synovial fluid comes out, let it coagulate until it drops off of its own accord, and use chloride of zinc lotion constantly (1 grain to 1 oz. of water). Any bits of loose skin must be, as far as possible, restored to original position. Whilst horse is recovering, give cooling food. When a broken knee is healed, dress the whole front of the knee and round it with James', or any similar blister to take off all the hair both above and below the injured part. In a month, during which it should be

gently rubbed downwards daily to make it lie smooth, fresh hair will have grown without any difference in colour to mark the wound as there would have been without the blister.

Gunpowder mixed with a little water will temporarily conceal a slight scar, on any dark coloured horse

Never stitch up a broken knee, don't probe it, don't cut off broken skin, don't poultice or apply hot fomentation, and don't bandage leg tightly, or you stop circulation of blood. Don't let the horse touch his knee with his mouth and forbid the syce using the favourite native remedy called Nilburee.

If the impediment in the throat can be felt by hand
 Choking. from outside, push it gently up
 and down ; if it can be thus moved,
 however slightly, the cure will probably be easy. Give
 liquids, such as gruel, or an emulsion made of equal
 quantities of oil and water mixed together by a small
 addition of carbonate of potash. Whilst swallowing the
 liquid, the horse's throat to be rubbed gently by hand.

On emergencies, pour as much water as possible down the throat in hopes that in coughing out the water, the obstruction will come with it.

A veterinary surgeon can clear the throat with a probany (too difficult an operation for a non-professional) or can make a cut into the throat called Tracheotomy.

An injection of morphia under the skin is useful to lessen the spasms of choking, which might kill the horse.

Apply carbolic ointment or lotion, or Friar's Balsam,
 Girth cuts. or zinc ointment. See if edge of
 girth has got hard ; if so, put on a
 bit of lambskin, hair side nearest body, or sew on a piece
 of lint in several folds.

The FitzWilliam girth is a good preventive. (Sold
 for 11s. by Davis and Co., 14 Strand, London.)

Don't let the shoe be wrenched off, but draw each
 nail separately and examine it at
 Pricks in shoeing. once. If there be moisture on it,
 the injury is there. If lameness be severe, poultice
 foot for three days, and pare away the sole at the
 nail hole. When all pain has gone, rub in hoplemu-
 roma, or apply chloride of zinc. If the case is very
 bad with inflammation of foot, treat as for quittor.

From undue pressure of saddle or harness. If possi-
 ble do not work the animal, though
 Sore back or Should- he should be well exercised, and
 ers. bathe the spot effected for half an
 hour at a time, several times a day with a warm lotion
 of one wineglassful of arnica or spirits in half a bucket
 of water, if the skin is not broken, till the swelling has
 subsided. But on a campaign, or when travelling, this
 may be too tedious and impracticable; if so, bathe the
 part frequently with 1 ounce of salt dissolved in half
 a tumbler of water, and pour cold water from a bhisti's
 mussock on the spot twice a day from a height of 3 or
 4 feet as a douche. Water can be made cold by dissolv-
 ing a little nitre in it. If a bit of skin be knocked off
 without any swelling or tenderness, apply Friar's
 Balsam for a speedy healing. If there is a hot and
 tender swelling on the withers, inside of which matter

can be discerned by pressure of the finger, the treatment for Fistula must be followed. For open sores apply either carbolie or zinc ointment, or the following is an excellent yet simple remedy: mix about 5 ounces of camphor with 1 fluid ounce of carbolie acid in a bottle, shake violently and before use put it in the sun or before a fire. Pour a little frequently over the sore, and at night apply a piece of lint steeped in the mixture to the spot, also if the horse must be used, whilst at work. This mixture is soothing, healing, keeps off flies and destroys maggots. It must have more camphor than the acid can melt, so if all the camphor be taken up, add more. With this proviso, either or both of the drugs may be added to the bottle as its contents are expended. Don't add oil or anything else. This is specially useful when a large number of animals, such as transport ponies, have to be treated, being cheap and efficacious.

If sores are inside, wash with alum and water. If at corners, use weak solution of
 Sore mouth. chloride of zinc; or if a hard lump is formed, rub in a little blistering ointment just above corner of mouth. See that bridle is made to fit properly.

Is a name given to a swelling or wound inside of and close to one knee from blow given
 Speedy cut. by the other fore-foot whilst going fast. If the injury be caused to the fetlock, it is called Brushing; when coronet of hind foot is hit by shoe of fore-foot it is a Tread; but if the heel of coronet of a fore-foot is injured by the shoe of hind foot it is an Over-reach. In each case the treatment is the same. First foment the swelling and clean out all dirt.

If very hot and tender, poultice for a day or two, and then apply carbolic ointment or chloride of zinc. The fetlock may be protected by a common "boot." Draw farrier's attention to the subject and use Charlier shoes as a preventive.

Faults and tricks.

The horse catches hold of any bar with teeth and then sucks in air, which spoils his teeth and digestion. This trick is soon acquired from seeing another horse do it, so separate a cribbiter from others. Put a lump of rock salt and one of chalk in his stall for him to lick at his pleasure. Remove all bars or smear them with kerosine oil. If very bad, get a "bar muzzle."

Usually stallions who indulge in this vice. If so, put a loose noose of tape round testicles and connect it by strap to the bit. This causes such pain each time he rears as to induce him soon to abandon the habit.

SECTION XVIII.

SWIMMING HORSES.

Copy of letter No. 2587-L., dated 18th June 1893, from the General Officer Commanding, Peshawar District, to the Adjutant-General in India.

102. I have the honour to forward, for the information of His Excellency the Commander-in-Chief, a report by Major Money, 9th Bengal Lancers, of the

course of instruction in swimming horses carried out under his orders.

(2). I saw all four squadrons swim the Kabul river on the last days of their practice, and accompanied the three squadrons on the 10th of June.

(3). I was much struck by the confidence displayed both by men and horses—the result of sound and careful instruction.

(4). There was no hesitation on the part of the horses in entering the water; many of them galloped in, and appeared to enjoy the swim as much as the men, who evinced the greatest keenness and interest.

(5). The Kabul river, at the place selected, was about one hundred yards wide with a current flowing at a velocity which I estimated at a little more than four miles an hour. No horse was carried down stream much more than a hundred yards.

(6). The experiment was carried out as follows:—

Each squadron having been drawn up on the bank, the men were ordered to—

Dismount.

Undress.

Unsaddle.

Pack saddles and kits in blankets.

Load kits in boats.

Mount.

Advance and swim river.

Unload boats.

Dress.

Saddle.

Mount.

Advance about 100 yards.

Dismount.

Fire a volley.

The average time occupied by each squadron from the order "Dismount" till the first volley was fired was, as nearly as possible, 20 minutes.

(7). The few non-swimmers among the men crossed in the boats with the kits, their horses being led across by some of the best swimmers, who had no difficulty in managing two horses.

(8). The rafts designed by Captains Peyton and Angelo were in the first instance taken across by the men.

On the return journey the experiment was tried of making horses tow them. As stated by Major Money, this proved most successful.

(9). I also directed a number of horses to be turned loose and driven across. They crossed without the least hesitation, rejoining their companions on the opposite bank.

(10). Major Money informs me that on the first day he found his own charger and many other horses most unwilling to trust themselves in deep water, but they rapidly gained confidence.

(11). The great success of the experiments shows the necessity for careful training, and also how little training is required. Three days' practice would appear to be sufficient. Without any practice, I doubt if any regiment would be able to cross a river without very great delay, and probably with some casualties.

Copy of a letter from the Officer Commanding, 9th Bengal Lancers, to the Assistant Adjutant-General, Peshawar District, No. 335-G., dated 15th June 1893.

In accordance with verbal orders received from the Brigadier-General Commanding, I have the honour to forward a report on the swimming of the Kabul river near the village of Khazana, on the Shubkadr road, by the regiment under my command.

(2). The spot which I myself selected with Captain Peyton is situated about 9 miles from the lines of the regiment, and is a most suitable one for the purpose required.

(3). With the help of two boats kindly lent by the Executive Engineer, Public Works Department, one of which was kept in the middle of and some way down stream, and whereon two of the best swimmers were invariably posted ready to assist any man in difficulty, the danger of any one being drowned was reduced to a minimum. I am glad to be able to report that the whole of the practice was completed without casualty of any kind.

(4). The first squadron was instructed by Captain A. G. Peyton, the squadron commander. Owing to so many officers being absent at different classes, and in order to finish the swimming of the whole regiment during the most favourable season of the year, and before the second leave and furlough men went away, I divided the remaining six troops into two parties, the first of which, consisting of 3rd, 4th, and 5th troops,

was instructed by Captain F. W. P. Angelo. and the second, consisting of the 6th, 7th, and 8th troops, by myself.

(5). I forward the reports of the two abovenamed officers.

(6). With regard to the instruction of the 6th, 7th and 8th troops, it was carried out in a similar manner to that described by Captains Peyton and Angelo.

(7). A statement showing the number in each class of swimmers in the above three troops is attached.

(8). Two horses in the whole regiment were found to be quite unable to swim. Those horses which were not good swimmers have since been instructed.

(9). The rafts, as described by Captains Peyton and Angelo, made up of lances, mussucks and leading ropes all of which articles would be available with each squadron on active service, would, in the absence of wood, answer the purpose perfectly, and there would be no difficulty whatever in crossing any river.

(10). In the presence of the Brigadier-General Commanding, the 1st squadron crossed the Kabul river on the 13th May 1893, and General Kinloch saw the 2nd, 3rd, and 4th squadrons cross the same river on the 10th June 1893.

(11). In accordance with the Brigadier-General's instructions, an experiment was made of making horses tow the rafts across, and was found to answer admirably. On service this would save the good swimmers, who, as a rule, are the best men, for it is very tiring to pull or

push these rafts when swimming. Two horses were attached with ropes to each raft. This, of course, would only be necessary in the event of a broad river; otherwise men on land could pull the rafts to and fro.

(12). Every man and every horse present, with the exception of recruits and young horses, has now undergone a course of instruction, and an early opportunity will be taken of instructing any men who were absent on command, furlough or leave.

(13). I would, in conclusion, beg to state that I would now have no fear of crossing pretty well any river in India with the 9th Bengal Lancers. The horses know now what is required of them, and men have every confidence.

9TH BENGAL LANCERS.

Statement showing numbers of swimmers in each class in the 6th, 7th and 8th Troops of the above corps.

Troop.	MEN.						HORSES.			REMARKS.
	NATIVE OFFICERS.			NON-COMMISSIONED OFFICERS AND MEN.			Good swimmers.	Indifferent.	Non-swimmers.	
	Good swimmers.	Indifferent.	Non-swimmers.	Good swimmers.	Indifferent.	Non-swimmers.				
6th	1	...	...	41	5	3	51	2	...	...
7th	...	...	2	27	2	5	50	3	...	...
8th	1	...	...	28	...	6	47	3	...	1
Total	2	...	2	96	7	14	148	8	...	1

PESHAWAR; }
The 15th June 1893. }

Swimming Instruction.

ORDERS having been received for the men and horses of the regiment to be instructed in swimming a river. The 1st squadron was told off for that duty, and went through the following course:—

On Monday, May 1st, the squadron paraded in Hindustani clothes at the tank in the 9th B. L. lines, and the men were examined to test their swimming capabilities. They were divided into three classes—

- (1) Those who could swim well.
- (2) Those who could swim a little.
- (3) Those who were unable to swim.

Of the 1st Troop, out of 40 Native officers, non-commissioned officers and men present, there were of—

Men who could swim well ...	...	...	28
Men who could swim a little ...	...	...	6
Men unable to swim ...	...	...	6
			<hr/>
			40
			<hr/>

Of the 2nd Troop—

Men who could swim well ...	...	...	32
Men who could swim a little ...	...	...	5
Men unable to swim ...	...	...	5
			<hr/>
			42
			<hr/>

Making a total in the squadron—

In class (1)	...	...	...	...	60
" (2)	...	...	...	...	11
" (3)	...	...	...	...	11
					—
					82
					—

On the following day the good swimmers paraded Tuesday, May 2nd, with their horses, the remainder without horses (at the tank).

The following points were explained to the men—

(1). That in entering a river the horses should be ridden in until the horse is out of his depth, when the man should slip off to the down-stream side and hold on to his horse by his mane.

(2). The reins should be knotted, and a lock of the mane put through the knot to prevent their slipping over the horse's head.

(3). That the horse should be guided by splashing water into his face. (In practice this proved to be useless.)

(4). That in cases where a horse showed no disinclination to cross a river, that it would be as well to catch hold of the horse by his tail, as it leaves him free and does not impede his swimming action. Having impressed these points upon them, each man in turn was made to enter the tank with his horse and swim round it.

Fig. I.

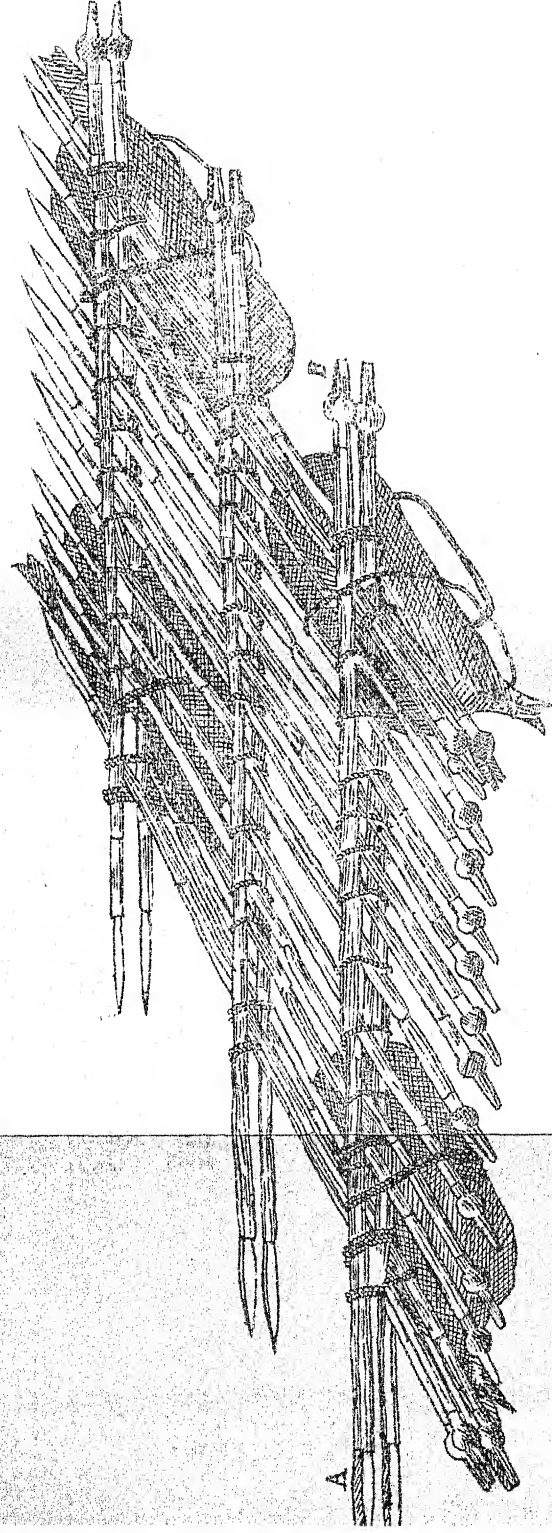
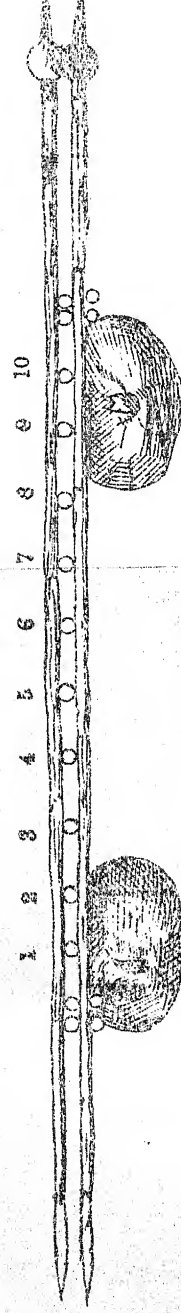
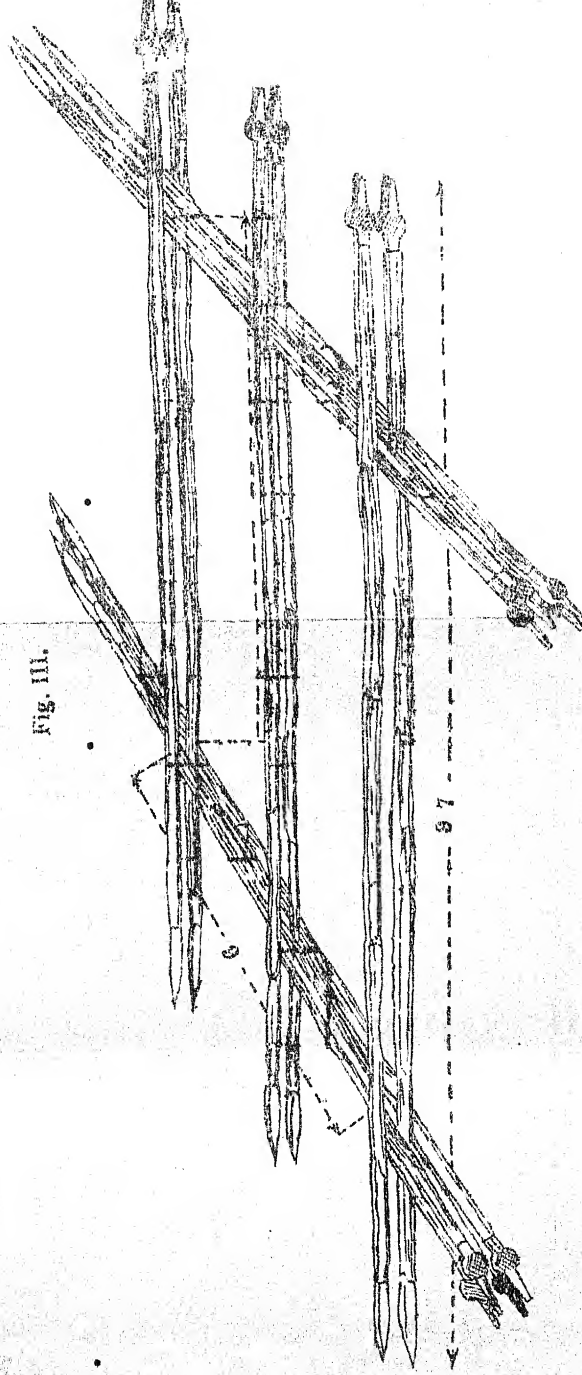


Fig. II.

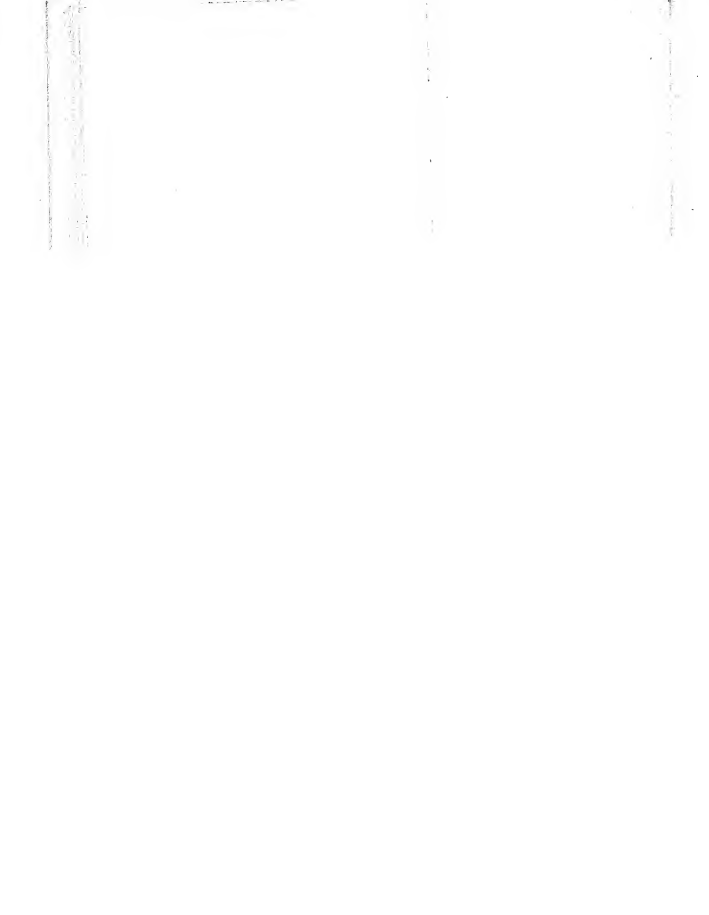


Section on A. B.

Fig. III.



To commence the Raft



Half the distance the horse was held by the mane, the other half by the tail.

The men who could only swim a little were given an hour's swimming practice.

Those who could not swim at all were placed under instructors, and taught to swim by means of a rope fastened round their chest and under the armpits, and which was attached by the other end to a pole.

The pole was held by a man on the bank.

On May 3rd the squadron paraded at the tank for instruction in making rafts.

Wednesday, May 3rd,
1893.

The only available materials at the time were lances, leading ropes, and mussucks, of the latter, of which there are *eight*,* per squadron.

After many experiments, we evolved a raft which, I think, is as good as can be made with the materials. To commence with, a lance is non-supporting, as it will not float; therefore the mussucks have to carry the weight of the lances in addition to anything that might be put on them.

It therefore became necessary to utilize as few lances as possible.

I attach a diagram† showing the way in which the raft is constructed.

* Should be ten. E. G. Money, Major.

† Plate I.

The following materials are necessary to make a raft :—

Lances . . . . .	...	...	...	30 (or 20) *
Leading ropes . . . . .	...	...	...	12
Mussucks . . . . .	...	...	...	4 †

Fig. (III) shows how to commence the raft; there are four lances each side and four through the centre.

These lances are then lashed at the corners so as to make a square with 6 feet sides, the whole length of the lance being 9 feet 7 inches. If a larger square is made, the lance shafts are apt to be broken with the weight placed upon them.

Care should be taken to have two complete sides free from points. This can be done if the lances are arranged as shown in diagram.

Ten lances are then slipped in between the lances forming the frame-work (Fig. II), and evenly distributed over the surface. They should then be securely lashed in position (Fig. I).

The four mussucks having been filled with air and securely tied up are now fastened on to the four corners of the raft, but well underneath.

If a fifth mussuck is available (and it is very necessary), it should be fastened in the centre.

The raft (which can easily be carried by a couple of men) can now be turned over and placed in the water.

* Half the number of lances can be used, but it makes the sides rather weak.

† It is better to make one raft with 8 mussucks than two with 4.

A raft of this description will carry four maunds without sinking to the level of the water. Its weak point is that, in the event of the air escaping out of the mussucks to any great extent, the whole thing would sink.

But I need scarcely remark that if planks or any cut wood was available a raft of the above description would not be made.

I had a raft of lances taken across the river with a considerable weight upon it.

It was perfectly buoyant, though the strength of the current caused the water to wash over it to a certain extent.

It is presumed that on service the men would carry the canvas chugul, patterns of which are kept in all store-rooms. I found that, after having them well soaked with water, they became air-tight. Some thirty or forty of these with lances would be capable of sustaining great weight. As there are only two in the store-room, I am unable to test their capabilities thoroughly.

When sending my raft across the river, I took the precaution of fastening a long rope to it with an inflated mussuck at the other end, so that in case it had by any unforeseen accident sank, I should have been able to recover it.

Having the previous day found a place suitable for
 Friday, May 5th. crossing, and having by personal
 experience found how difficult it
 was in a swift current to make a horse cross the stream,
 if he was unwilling to do so, arrangements were made
 to have a boat on the spot.

The first two horses were towed across separately by means of a long rope fastened to their bits, the other end being held by a man in a boat. Each rider holding on to his horse's mane and guiding him as far as possible.

When the third horse was being towed across, another man was ordered to put his horse in the water to see if he would follow the lead. This proved at the first, second and third attempt a failure, as each time after the horse had been carried some way down the stream, he fought his way back to the bank.

After this four horses were sent in at a time; two, besides the towed horse, succeeded in reaching the opposite bank.

From this time there was no further difficulty, all the horses, with about two exceptions, crossing without assistance from the boat.

When a batch of horses entered the river, the men on the opposite bank used to shout. This had an excellent effect, as it attracted the swimming horses' attention and made them go for their companions.

The horses were all fed on reaching the opposite bank.

After this, the horses were mounted, and the men entered the water in column of sections with about twenty yards' interval between sections and some five to ten yards between files.

All the horses crossed without the slightest bother.

The results of to-day's practice went to show —

- (1) That horses don't fear the water.
- (2) That splashing water on a horse's face will not make him go the way you wish him to if he has different ideas on the subject.
- (3) That if a horse objects to crossing, the only thing to do is to slip a finger through the ring of the bridoon, and, by swimming a little in front of him, force him to follow; but you must head your horse. Or if you tighten the rein furthest from you, you can keep his head half upstream.

The squadron paraded on the bank with horses in full marching order, and the men Saturday, May 6th. were practised in packing their kits and making rafts in the following manner.

The squadron having been dismounted, the order was given to unfasten leading ropes.

Even numbers were then ordered to fall out and place their lances and leading ropes on the ground in front of their troops.

As soon as this was done, odd numbers were ordered to fall out and do the same.

The non-swimmers, to the extent of six per troop, were ordered to fall out as raft-makers, they having previously been instructed in making them.

While the rafts were being made, the remainder of the squadron were ordered to spread their blankets on the ground, to undress, unsaddle, and to tie up the whole kit in the blanket.

After this each man was practised in making a raft, and shown how the lances should be lashed.

Monday, May 8th, 1893. The whole squadron paraded at the Kabul river at 6 A.M.

The squadron was formed up and dismounted, as detailed in yesterday's drill.

Lances and leading ropes having been piled in front of troops, the non-swimmers set to work to make the rafts, while the remainder of the squadron undressed and packed their kits into blankets.

This having been done, a certain number of the 1st Troop were told off to place the "1st Troop kits" into the boat that was there for the purpose.

Four good swimmers were told off to reach raft (2).

The remainder of the 1st Troop mounted and swam the river by sections with an interval between.

Every horse crossed without giving the least trouble.

As soon as the 1st Troop kits had been landed, the boat was loaded with the 2nd Troop kits, the latter troop mounting and swimming the river in the same formation as the 1st Troop.

During this time the rafts, which, had been loaded with logs of wood to test their carrying capabilities, were successfully piloted across the river and were quite successful.

The horses were now fed, and after an interval re-swam the river.

Wednesday, May 10th, 1893. The squadron paraded again at the river.

The 1st Troop were instructed after crossing to boot and saddle on the other side of the river, to advance a hundred yards, dismount, and fire a volley, with a view of seeing how long it would take.

Owing to there being only one small boat to take the kits across, and which had to make four trips, the troop took 45 minutes from the moment they received the order to undress and unsaddle to the time that they fired their first volley.

I saw that, with the assistance of a larger or more boats, the time could be considerably reduced.

The 2nd Troop was in the meantime employed in making a raft out of logs of wood, which was quite successful; only owing to its great weight it had been taken some hundred and fifty yards down the stream before it was brought safely to the other bank.

The horses were fed and then returned to the other bank, this time by troops, first front rank, and then rear rank.

The squadron paraded on the banks of the river to swim across in presence of General
 Saturday, May 13th, Kinloch, Commanding Peshawar
 1893. District.

The 1st Troop was detailed to swim the river as on the previous day, and to remount and fire a volley to show how quickly it could be done.

A boat was in attendance, capable of carrying all the first Troop kits in one trip.

From the moment they received the command to undress to the firing of the first volley on the opposite bank occupied exactly twenty-five minutes, but to the

time they were mounted ready to attack was only twenty minutes.

The 2nd Troop constructed a raft of lances and mussucks, and, two men being placed upon it, it was taken to the other side of the river.

The rest of the troop swam across.

At the request of General Kinloch, experiments were made to see if horses would cross the river forwards and backwards of their own accord if they were given a lead.

First eight men swam their horses across, four others being sent in without riders, and all crossed.

On returning, the twelve men dismounted before they got into deep water, and the horses all made straight for the opposite bank without their riders.

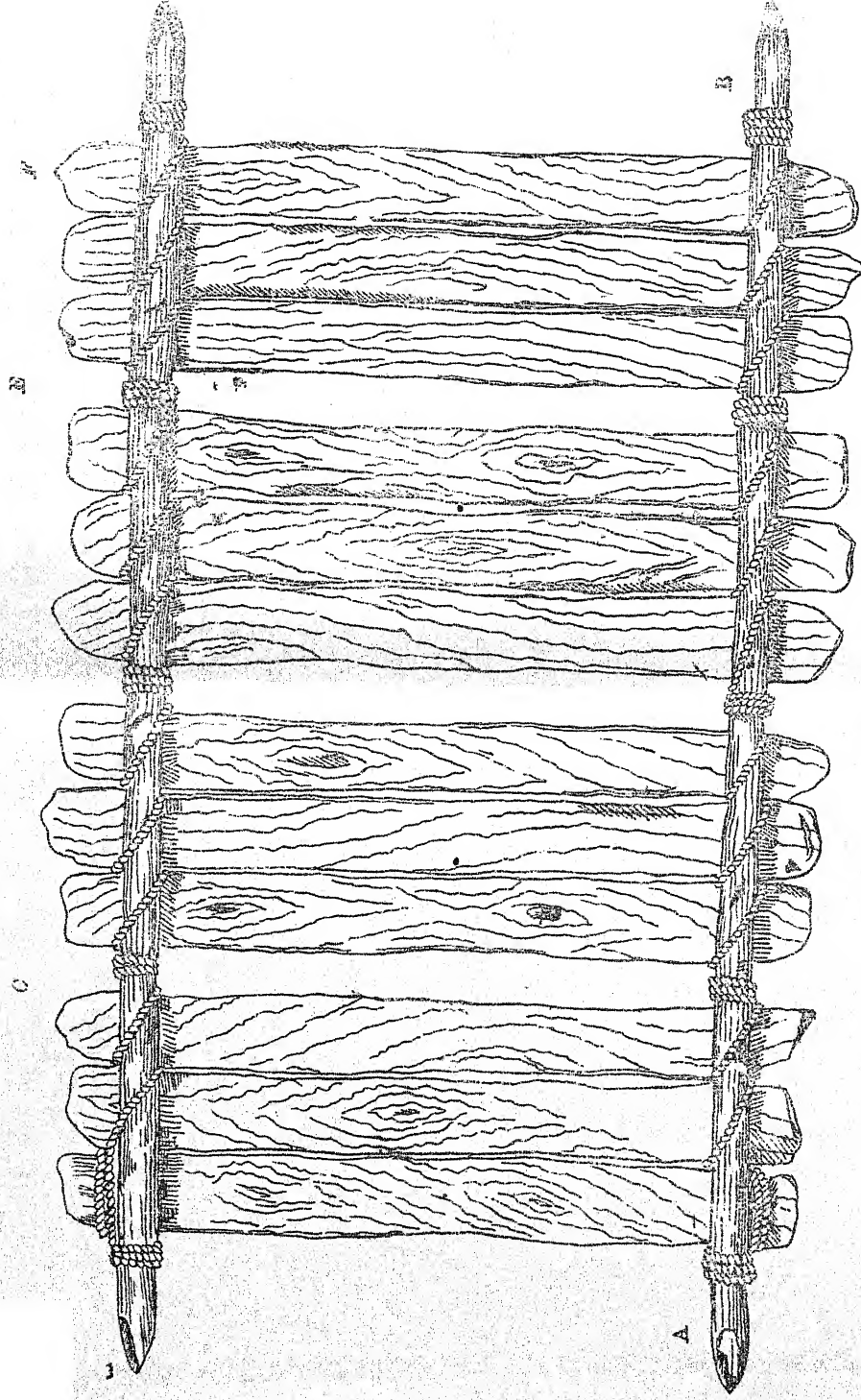
This of course, means a great saving of time in the case of a regiment having many non-swimmers, as if they are properly trained, the horses of non-swimmers can be driven into the water with the rest of the regiment instead of men having to return across the river to take them over.

This concluded the swimming instruction of the 1st squadron. I may add that at this date every man of the squadron present is capable of taking his horse across the river.

Attached is a sketch* showing construction of a log raft. This was made by the 2nd Troop on Wednesday, May 10th. It was capable of carrying great weight; but, being in itself so heavy, it was a somewhat difficult business getting it across the river.

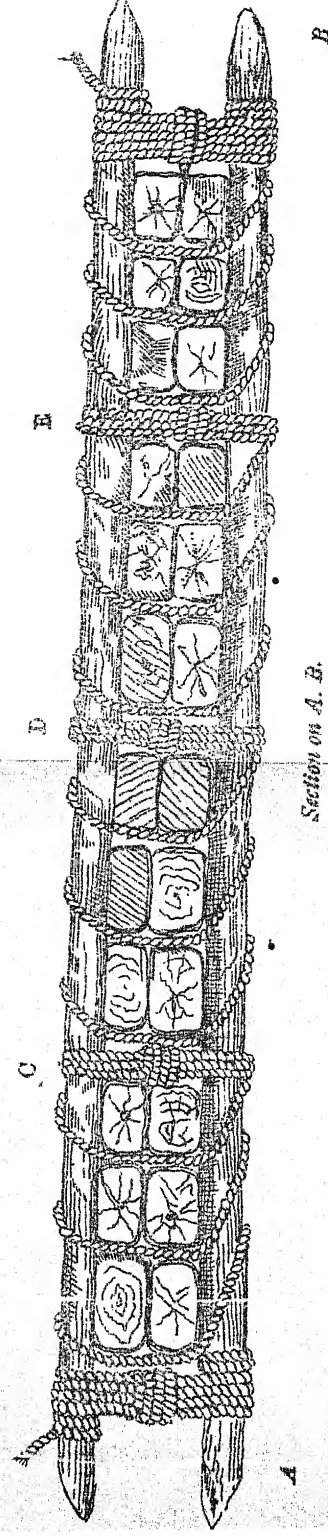
* Plate II.

Fig. I.



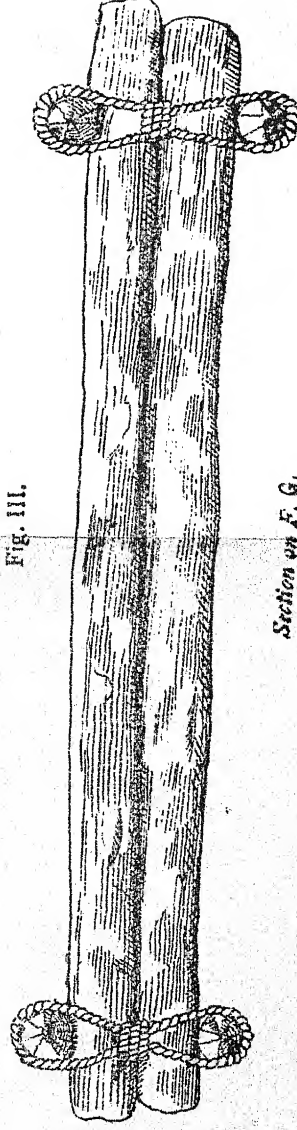
LOG RAFT

Fig. II.



Section on A. B.

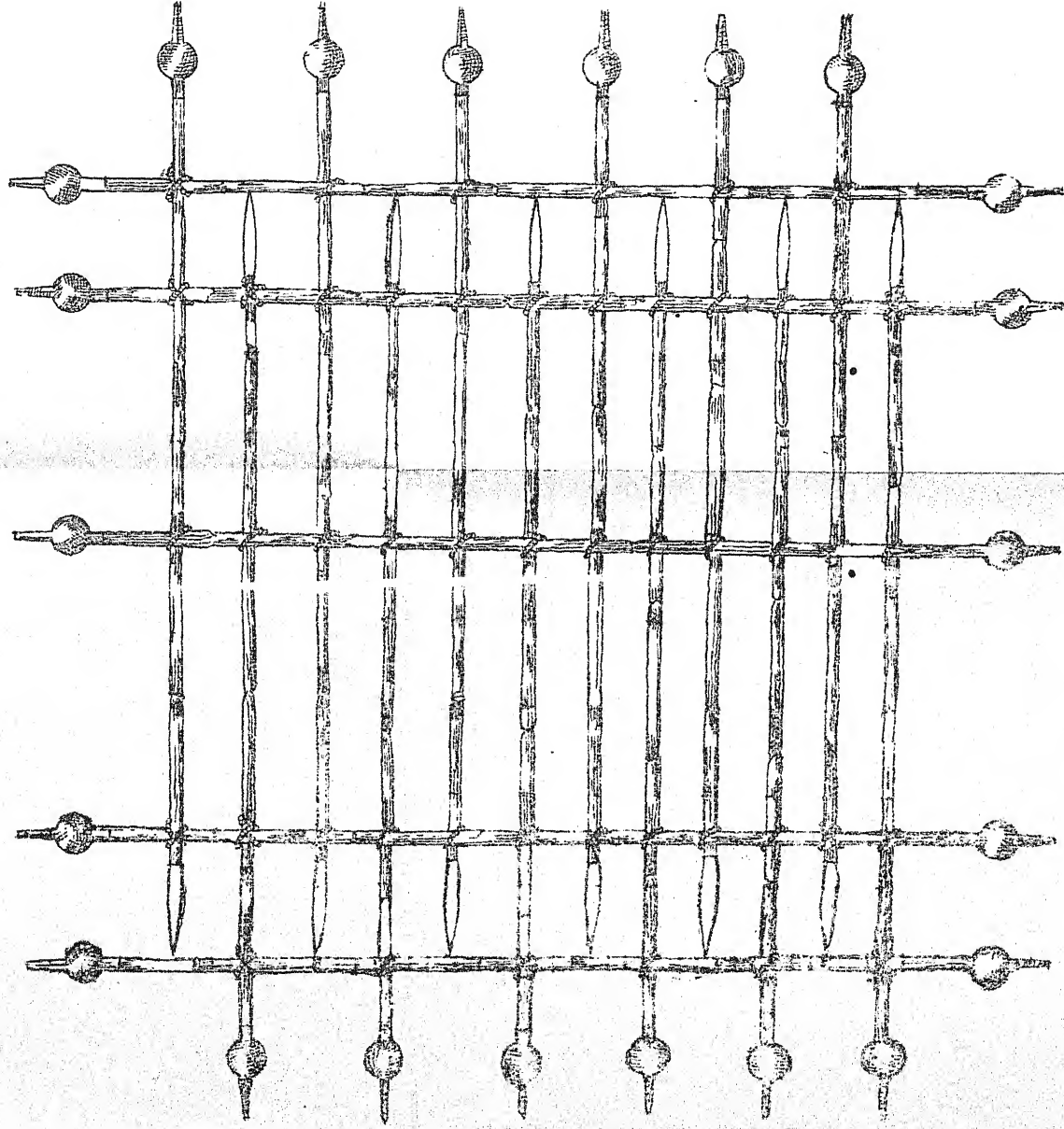
Fig. III.



Section on F. G.

Raft of Lances with lance points protected.

This Raft takes longer to make, is frailer, and is not so good as the one described on Plate I.





The spaces left at C., D. and E. are necessary to enable one to securely lash the cross logs.

The lashing shown in Figs. II and III are, I think, the best to use, as they can be made very tight.

The diagram on Plate III shows how a raft of lances may be made with all the points protected.

I have the honour to report that the instruction in swimming of my squadron and the 5th Troop was carried out on similar principles to that of the 1st squadron, and was conducted as follows.

(2) On the 15th May I commenced by examining all the men in the tank within the regimental lines, and classified them as under—

	3rd Troop.			4th Troop.			5th Troop.		
	Native Officers.	Non-commissioned officers.	Men.	Native officers.	Non-commissioned officers.	Men.	Native officers.	Non-commissioned officers.	Men.
Good swimmers ...	1	7	31	...	9	34	1	8	27
Indifferent swimmers, ...	...	...	6	...	...	...	...	...	...
Non-swimmers ...	...	...	8	...	...	4	...	...	3
TOTAL ...	1	7	45	...	9	38	1	8	30

(Further instruction of indifferent and non-swimmers.

(3). The indifferent and non-swimmers paraded twice daily at the tank for instruction.

(4). I paraded all the horses of the 3rd, 4th and 5th Troops (including the young ones) on the 15th and 16th May at the tank, and made the good swimmers take them round. The majority of the horses swam very well. Some few were rather awkward and nervous, and one (water) mare only was unable to swim.

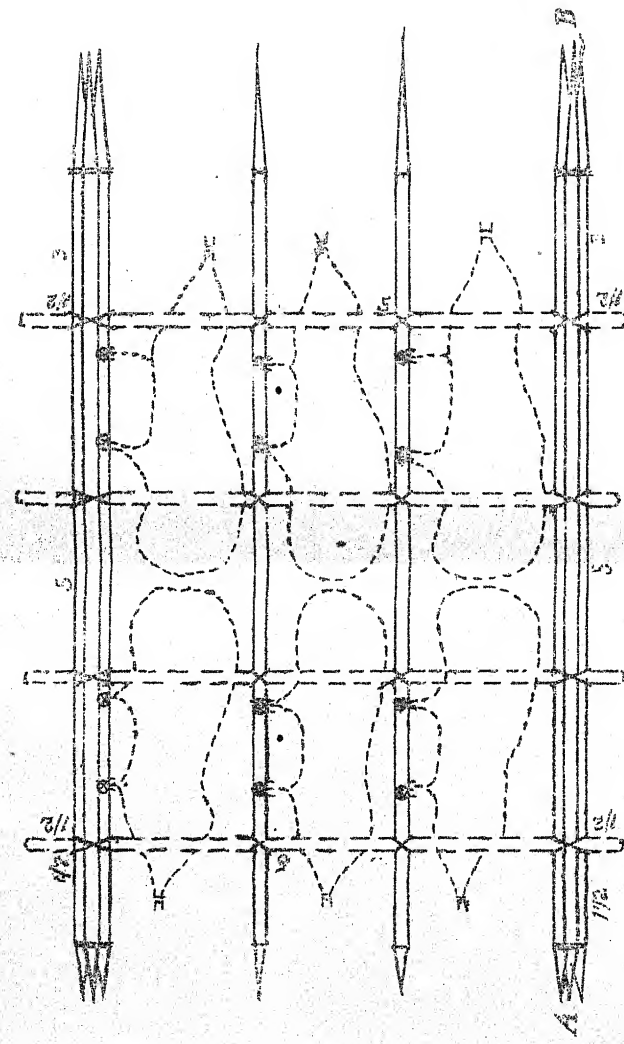
(5). The three troops paraded on the banks of the Kabul river, near the village of Khazana, at 6 A.M. on the 17th May. With the assistance of a boat I towed one horse across the river; then returned and towed another, ordering four others to follow. Two of the latter swam across very well, the remaining two turned back to shore again. I then towed two horses across and ordered eight others to follow, of which only two returned to shore, the horses seemed to see now what was required of them, and the remainder of three troops crossed by "fours" (eight men), with the exception of two horses I was obliged to tow across.

As each horse arrived on the opposite bank, it was placed in a conspicuous position, and as near to the water as possible. It was then fed.

While crossing, a great many men remained on their horses' backs for a considerable time, others for a short period, and a few rode across.

It appears to me that the best plan was to remain mounted as long as possible, and then to stretch full

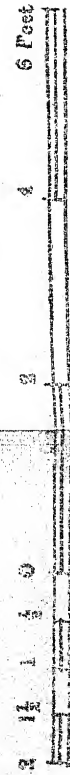
Raft made with Lances, Leading Ropes, Muesacks,
and tent Poles.



Section on A. B.



Scale 1 Inch = 2 Feet.



length over the horse and swim with him, keeping slightly on the down-stream side, as by so doing you can direct the horse very well. Some men got of and then on again when in difficulty.

I particularly noticed that men who threw themselves off as soon as their horses got into deep water seemed to have a great deal more difficulty in steering their horses straight.

The troops re-crossed the river by troops in line most successfully.

(6). On the 18th and 19th May the men were instructed in making rafts. I confined myself to two kinds, *viz.*, the one recommended by Captain Peyton, capable of carrying four maunds and constructed with the following materials, *viz.*,—

30 Lances,
12 Leading ropes,
8 Mussucks,

and another kind, evolved by myself (a diagram* of which is herewith attached), capable of carrying $7\frac{1}{2}$ maunds, *i.e.*, the kit (with the exception of saddle) of an officer's patrol of 8 men or one "group," and constructed with the materials, a party of that strength could actually carry on service, *viz.* :—

8 Lances,
6 Leading ropes,
6 Mussucks, and
4 Tent poles.

* Plate IV.

To test the above, I prepared an officer's patrol, under Ressaldar Sunder Singh, which crossed the river successfully. The horses were taken across with their saddles on, and five men, corresponding in weight to eight men's kits were placed on the raft and taken over.

(7). The three troops paraded in marching order at 6 A.M. on the 20th instant to Second crossing of practice crossing the Kabul river again. The river was in flood this time. Each troop in succession was ordered to dismount and tie up their kits in their blankets, put them on to a big boat moored by the bank for that purpose, then swim their horses across. On arrival at the opposite bank, they were to dress and re-saddle, advance 200 yards in reconnoitring formation, and fire five volleys, then retire.

I took the time each troop took to carry out the above from beginning to end, and it was as follows:—

3rd troop	...	...	...	21 minutes.
4th "	...	...	...	25 "
5th "	...	...	...	19 "

The horses were taken into the river by "sections," with intervals of two yards, and distances well kept. The crossing was most successful.

The non-swimmers assisted each troop in getting their kits into the boat, and also were employed in making rafts.

When re-crossing the river a few horses were driven over. Some men were sent over in charge of two horses. They all crossed without any difficulty.

(8). The "column" formation succeeded better than the "line," which I attribute to the advantage the horses of the former got by having some good swimmers put among the leading sections to give a good lead.

(9). I was very fortunate in having a large number of strong swimmers, who were able to manage the horses properly to begin with, or otherwise I may have been obliged to practise the troops more than I did.

OFFICE OF THE ADJUTANT GENERAL IN
INDIA.

HEAD QUARTERS;

Simla, 20th July 1892.

NEW METHOD OF SWIMMING HORSES.

109. Scobelef's orders in 1882 were, cavalry are to cross rivers as follows :—

(1). If the river is small, the men's kit, arms and saddlery go over in boats and rafts and the men swim with their horses.

(2). If the river is large and swift, the men go over in boats, with their kit and saddlery, towing their horses after them.

(3). If there are no boats or rafts, a detachment of the best swimmers with their rifles, ammunition and entrenching tools hung round their necks, swim across with a rope by means of which the other men pull themselves across. The horses with their bridles hooked over the cantle of the saddles are then driven over *en masse*.

The new method is invented by a sergeant and consists of a bag of canvas soaked in some waterproof mixture and capable of being hermetically sealed. This bag weighs over 2lbs. and is $4\frac{1}{2}$ feet long by $2\frac{2}{3}$ feet broad. Into this bag is put the man's clothing, arms and saddlery, and it appears that the bag, filled with all these things and hermetically sealed, not only does not sink, but will bear a certain amount of weight. To one of the ends of the bag is tied a rope with a slip knot. The possession of such an article, even if there were only a few in each squadron would greatly facilitate the passage of cavalry across broad rivers.

This was tried on the river Suprast near Bielocktok with complete success, the man holding his horse by the mane and putting the noose of the bag over his shoulders.

N.B.—Not only are the canvas bags useful for making rafts but also as cornsacks and for keeping saddlery, &c., from rain or dew in camp.

SECTION XIX.

The following drill for entraining and detraining a squadron, by Captain W. H. Fasken, 10th Bengal Lancers, will be found useful:—

ENTRAINING A SQUADRON.

Duties of the officer preceding the squadron. 110. (1). The duties of the officer preceding the squadron are as follows:—

- (a) He will number off with chalk, front to rear—
 - (i) Pony trucks, which should be those nearest the luggage van.
 - (ii) Horse trucks.
 - (iii) Passenger compartments for sowars, on the floor just inside the door, or on the foot board, not on the pannels.
 - (iv) Compartments for the use of the followers which will be marked with a cross only.
- (b) He will then inspect the flooring of all trucks, and if any have iron floors, will arrange to have them covered with sand or litter.
- (c) On the arrival of the squadron, he will proceed to the luggage van, and superintend the packing of pony loads, which should be packed lengthways, and not across the van.

(2). The squadron will parade in marching order, and will be told off in groups of seven men and one non-commissioned officer. The non-commissioned officer will place himself on the right of his group, and tell it off, numbering himself "one."

Parade of the squadron.

(3). The groups will then be numbered off from the right of the squadron, and it will be explained that the number of the group will be the number on the horse truck, and compartment, which they are to occupy.

Numbering off of the groups.

(4). Group commanders will take every opportunity, before arriving at the station, of instructing the men of their groups in their duties.

Instruction of groups.

(5). On arrival at the station the squadron will form up in single rank facing the train each group in front of the truck bearing its number.

Groups forming in front of trucks.

(6). On the "dismount" sounding, groups will act as follows independently :—

Duties of groups.

(a) Odd numbers dress up, and the whole dismount.

(b) No. 5 collects the lances, and deposits them in the brake van, and then proceeds to the luggage van to assist in packing pony loads, etc.

- (c) Even numbers take all swords, carbines, and great coats if required, and lay them down in rear, under charge of the sentries (the 2 squadron camel sowars).
- (d) All take off bits (leaving on bridoons) and saddles, and secure them in their saddle cloth.
Jhool or blanket up the horses, if ordered.
- (e) Place saddles in rear, first the even, then the odd numbers.
- (f) "Lead on." First one side of the truck is filled, and the bar fixed, then the other. Nos. 3 and 7 remain in charge of the horses, and close the truck.
- (g) Even numbers carry saddles to the brake-van, and then take the arms and great coats to their compartment.
- (h) No. 1 having reported to the squadron commander proceeds to his compartment.

Relief of men in horse trucks. (7). Men on duty in the horse trucks will be relieved about every two hours.

(8). The baggage animals will fall in in rear of the squadron under the charge of an officer. Syces must be warned to have horse's gram, and other things required during the journey, in separate bundle. On arrival at the station the officer will allow them to fall out, half at a time, to make over these bundles to the men to whom they belong.

(9). The officer in charge will then act as follows:—

Duties of officer in charge of baggage animals.	(a) Select six or eight stout syces to pack loads, handing their ponies over to other syces.
---	--

(b) Conduct ten ponies as near the luggage van as possible, have their loads thrown off, then take them to the furthest of the pony trucks and direct them to "lead in." The remainder similarly in succession.

(c) He will remain at the pony trucks, and superintend the entraining of the baggage animals as they arrive.

(d) He will conduct the followers to their compartments and see them seated.

N.B.—If a horse refuses to enter the truck, two men standing at either flank should link hands behind and below horse's buttocks and heave his hind quarters forward and thus half lift half push him into the truck. Instead of linking hands a rope can be used. Or a rope noose bridle should be put over the horse's head and through his mouth in such a way that on the spare end being pulled the rope draws back the corners of his mouth. In theory this ought to pull up a horse, in practice it makes him walk forward.

DETRAINING A SQUADRON.

(10). On the "dismount" sounding:—

(a) No. 1 will go to his horse box: Nos. 3 and 7	will accompany him if they have
Duties of groups on the dismount sounding.	been relieved, and will relieve the men on duty, who will return to their compartment.

No. 5 will get out the lances and place them in rear of his group, he will then go to the luggage van and assist in unloading.

- (b) Even numbers take out arms and great coats and place them at the back of the platform in charge of the sentries (the 2 camel sowars).
- (c) Even numbers get out saddles, and place them with the arms. Nos. 1, 3 and 7 open the truck.
- (d) "Lead out."
- (e) "Saddle up."

(11). Syces will at once proceed to their pony trucks, open them, lead out their ponies, and, under the orders of the officer in charge, will file by successive groups to the luggage van, load up, and fall in in rear of the squadron.

SECTION XX.

FORM FOR SQUADRON TRAINING INSPECTION REPORT.

111. The following form of squadron training inspection report embraces most subjects and will be found very useful :—

PATIALA LANCERS.

REPORT OF THE INSPECTION OF _____ Squadron _____
 made in _____, at _____
 by _____ Commanding _____
 Training began _____ Training ended _____

Rank and name of Squadron Commander_____

„ Right half „ „ _____

„ Left „ „ „ _____

Rank and names of Troop
Commanders.

Average number present under arms during training,
N. C. Os. _____ Men _____

I examined the above Squadron at the conclusion of its annual squadron training. From what I heard from the commander, and also from my own personal observation, I think, with regard to the points upon which I touch, that the results are as follows :—

Notè.—This form was given to squadron leaders to assist them in allotting time at their disposal.

MOUNTED DRILL AND MANŒUVRE.

*Questions.**Answers.*

(1) (a) What is your opinion of the Squadron commander as regards his knowledge of drill and manœuvring?

(b) Is he quick, able, energetic and a good rider?

(c) Does his squadron appear thoroughly in hand?

Questions.

Answers.

(d) Does he take in orders quickly and intelligently?

(e) Does he ride well away from his squadron—and give a good word of command?

(f) Can he move his squadron on to a fixed or moving base by the shortest routes at all paces?

(2) Was the squadron drilled by the other senior officers of the squadron, and what is your opinion of their capabilities, as above?

(a) Are all the officers good riders? Name exceptions.

(3) (a) Did you see the troops leaders drill their troops independently?

(b) Do they display the qualities likely to make good squadron leaders?

(c) Did they keep a steady and even pace and correct direction?

*Questions.**Answers.*

(d) Do they thoroughly understand their particular responsibilities in the *advance in line, wheeling, and inclining* ?

(e) In the various evolutions of the squadron, did they lead their troops efficiently, keeping correct distances ?

(f) Have they good words of command ?

(g) Do the squadron commander and troop leaders drill their men satisfactorily by signal and by trumpet sound ?

(4) (a) Are the non-commissioned officers thoroughly efficient in drill ? Name exceptions.

(b) Did the centre-guides of troops accurately follow their leaders at the proper distance ?

(c) Do the men maintain the proper interval between files, both at the halt and in movement ?

*Questions.**Answers.*

(5) (a) Did you assure yourself that each man in the squadron is able to ride his horse away out of the ranks freely ?

(b) That each man is thoroughly proficient in the use of his arms (mounted) ?

(c) Is the squadron well trained in attack and defence drill, tent-pegging, lime-cutting and mounted combat ?

(6) (a) Do the men appear to have thorough knowledge of the principles of wheeling—the difference between wheels on a *fixed* and a *movable* pivot ? Were the wheels on a fixed and on a movable pivot properly done ?

(b) If there were intervals between troops, after a wheel into line, how were these corrected ?

(7) (a) In the advance in line were the paces correct, and was the direction true ?

*Questions.**Answers.*

(b) Have all officers and non-commissioned officers been thoroughly instructed in leading, and did you satisfy yourself that they can do this satisfactorily ?

(c) Did the men look and ride straight to their front ?

(d) Can the trumpeters blow correctly at rapid paces ?

(8) (a) Did the squadron go over the regimental jumps freely and smoothly ?

(b) Did the men individually ride well ?

(9) Did you see the commander "manœuvre" his squadron upon a distinct tactical idea given by yourself ? Did he display judgment and sound tactical principles in his choice of formation and movements when attacking infantry or artillery ?

(10) Did the manœuvre lead up to the attack in an

*Questions.**Answers.*

intelligent and comprehensible manner, and how was it delivered ?

(11) (a) Did you see the squadron attack at its fastest pace compatible with order ?

(b) Was the pace increased gradually, the alignment good, men riding close, no hanging back ?

(c) Did the squadron change direction at the gallop ?

(d) Did you accurately test the paces at which the squadron moved by timing its advance at a trot and gallop over measured distances ?

(12) After the "break up," "pursuit," or "retreat," did the squadron rally quickly, and well ?

(13) Are you satisfied that the men have been thoroughly instructed in the duties of ground scouts ?

(14) Are you satisfied that the squadron is so well trained as to be able to

*Questions.**Answers.*

manceuvre efficiently under its leader in presence of an enemy, either by itself or with the regiment ?

DISMOUNTED SERVICE.

(15) Did the squadron advance rapidly, utilize all possible cover, dismount quickly, and come into action in proper order ?

(16) Was the squadron halted for dismounted service in the best possible position as regards cover from fire, and *not directly in rear* of the line to be taken up ? And were the led horses afterwards moved at a *rapid* pace, but with perfect order, to such position ?

(17) (a) Did the troop and section leaders control the fire ?

(b) Were the distances fairly estimated, and the sights correctly placed for the different ranges, and were errors corrected ?

*Questions.**Answers.*

(c) Was the order to "cease fire" promptly obeyed?

(18) At the sound "Mount," were the led horses brought up quickly and in the best formation, and did the men mount and form up smartly, without confusion?

(19) Did you see the squadron dismount with "linked horses," and do the officers thoroughly understand the various circumstances which could guide their decision as to the proper proportion to be dismounted?

DETACHED DUTIES.

Information.

(20) (a) Has the squadron commander carried out a reconnaissance or other scheme with his squadron under general and special ideas set by you?

(b) In the dispositions he made, did he display

*Questions.**Answers.*

sufficient ability and knowledge of the subject?

(c) Were the signallers used to advantage?

(21) (a) Did the officers and non-commissioned officers in command of patrols show intelligence in carrying out their orders?

(b) Do they understand the proper method of passing and searching villages, woods, defiles, and every feature of a country?

(22) From your general observation, do you think the leader knows the capabilities of all ranks under his command well enough to employ the best men on the most important and responsible duties?

(23) So far as you can judge, were the features of ground used so as to obtain the widest view consistent with the greatest possible concealment?

*Questions.**Answers.*

(24) (a) Do all the non-commissioned officers distinctly understand what they have to report, and how to report it when employed in command of—

- (1) Officers' patrols,
- (2) Communicating patrols,
- (3) Reconnoitring patrols?

Name exceptions.

(b) Did you hear *verbal* reports delivered? Were they thoroughly reliable and intelligible?

(c) Have you carefully examined all the written reports sent in? Were they, on the whole, complete and reliable, distinctly written, and well and concisely expressed, and were the times of despatch and receipt noted?

(d) Was there any waste of time between their despatch and delivery?

(e) Did the men composing the patrols show

*Questions.**Answers.*

intelligence and aptitude for the work ?

(25) Do all officers and non-commissioned officers thoroughly understand what is meant by the term "Advanced squadron" and its various duties ?

(26) Name the officers and non-commissioned officers who have furnished sketches and reports in connection with the scheme given them, and are the selected men acquainted with the conventional signs ?

(27) (a) Can the officers readily read the principal physical features shown on a military map, the relative heights, directions in which valleys fall, &c. ?

(b) Can any of the non-commissioned officers do this ?

(28) Given a map and told its scale, are you satisfied that the officers can accurately take the distances

*Questions.**Answers.*

apart of any points shown on the map ?

(29) Are they able to write such a description of a road from a map as would enable a man to find his way by the road without map ?

(30) Have they learnt how to find their way in a strange country by the aid of a map alone ?

(31) Have officers and non-commissioned officers been instructed in the points to which special attention is to be given in reporting on a country, and do they appear to have correct ideas of the relative importance of these points ?

(32) Do you think the squadron is in all respects thoroughly trained and fit to take part in an extended cavalry reconnaissance in war ?

Questions.

Answers.

Protection.

(33) (a) Were squadron outposts placed upon a regular tactical scheme ?

(b) Were pickets and vedettes placed to the best advantage and with the utmost economy of men and horses, and were reliefs properly carried out ?

(34) Did the squadron leader make a judicious choice of the line to occupy with regard to the ground ?

(35) Did the pickets observe due precautions in marching to take up their positions and in posting their vedettes, and were the latter well posted ?

(36) Are the officers of the squadron thoroughly versed in their duties as commanders of pickets ?

(37) (a) Are the non-commissioned officers well versed in the duties of patrols ?

*Questions.**Answers.*

(b) Do they know the instructions to be given to, and the particular points to be looked for, by *standing, visiting, and reconnoitring* patrols ?

(38) Were the men well acquainted with the general and special order given to vedettes ?

(39) Do the officers and non-commissioned officers understand the main points to be observed in taking up a line late in the day, or in the dark ? And what changes to make and precautions to observe if they are called upon to remain on outpost duty at night ?

(40) Have the officers of the squadron an intelligent knowledge of outpost duty, and are they able to distinguish between the different systems of outposts which, under different and varying conditions, it would be found advisable to employ, and the relative

*Questions.**Answers.*

advantage of vedettes furnished from picquets or from cossack posts ?

(41) Do the officers of the squadron thoroughly understand that the security of the main body depends more on accurate information of the enemy's movements being obtained and transmitted, than on the mere occupation of the ground assigned to the out-post ?

(42) Did you see the squadron acting both as an advanced guard and a rear-guard in pursuance of a tactical idea, and were all ranks proficient in their duties ?

ESCORT TO GUNS AND
CONVOYS.

(43) (a) Do the officers and non-commissioned officers of the squadron thoroughly understand their duties when detailed as escort to guns ?

Questions.

Answers.

(b) Are they alive to the necessity for continual reconnoitring, and do they understand the relative position they should take up with regard to the battery ?

(44) (a) Do they distinctly understand the duty of a cavalry detachment when the three arms form an escort to a convoy ?

(b) Are they aware of the vulnerable points of a convoy in an open or a close country, and do they know how a defile should be passed by a convoy in an enemy's country ?

CAMPS.

(45) (a) Do the officers and non-commissioned officers thoroughly understand the best kind of ground to choose for picketing horses ?

(b) Are they well up in the points to be looked to in securing head-ropes and

*Questions.**Answers.*

heel-ropes, and the placing of horses in bivouac with regard to their greatest comfort and efficiency ?

(46) Are they well up in the principal points to be looked to as regards the watering, feeding, grooming and general care of horses in camp and bivouac ?

(47) Are the men expert in laying down the lines, driving head and heel-peg properly, and in the various methods of pitching and striking tents ?

(48) Have the men generally a knowledge of orders respecting drinking, bathing and cooking places ?

(49) Have the men been instructed in the expedients for securing their comfort in camp or bivouac ?

ENTRAINING AND DETRAINING OF HORSES, ETC.

(50) (a) Did you see the squadron entrain and

*Questions.**Answers.*

detrain its horses, and was the result such as to show that it had been frequently practised in this exercise ?

(b) Are the men properly trained and expert in the method of packing tents, kits, etc., in railway wagons ?

(c) Are they thoroughly acquainted with the principles and practice of loading transport animals ?

(d) Did you see the pioneers at work ; if so, would they be of much assistance on service ?

SECTION XXI.

INSPECTION BY INSPECTOR-GENERAL OF
CAVALRY IN INDIA.

Memorandum giving the probable programme for the inspection of
Regiments of British Cavalry by the Inspector-General of Cavalry
in India.

1st DAY.	{ Dress—Riding-School order. }	{ Riding School }	...	{ Morning. }	(1) Officers' ride, including Majors in command of squadrons and the Regimental Sergeant-Major.
					(2) Sergeant-Majors and Sergeants.
				{ Afternoon. }	(3) Corporals.
					(4) Casuals and employed men.
					(5) Horses 15 years of age and over, but not on the list of casters, to be paraded on a large circle, mounted.
					(6) Recruits joined since last inspection.
					(7) Remounts joined since last inspection.
					(8) Recruits under training.
					(9) Remounts under training.
					(10) A squadron to be named by Inspector-General of Cavalry under its own officers. A roll of the squadron to be furnished.

2ND DAY, MORNING.	Dress—Drill order.	<p>Squadron drill ... Squadrons to parade by wings at an interval of one and a half hours.</p> <p>All officers and non-commissioned officers are expected to be able to give full instructions for squadron drill and to apply their knowledge of the book practically. In addition officers must be able to meet the sudden attack of an enemy from any direction.</p>
2ND DAY, AFTERNOON.	Dress—As for Stables; no swords.	<p>Inspection in barracks, Before the inspection of horses and baggage animals there will be inspection in barracks as under :—</p> <p>Subalterns packing kits, Subalterns packing kits.</p> <p>Saddlery ... One squadron—saddlery.</p> <p>Kits and cloaks ... One squadron—kits and cloaks (cloaks to be worn).</p> <p>Arms ... One squadron—lances, carbines and swords.</p> <p>Blankets and bedding... One squadron—horses to be blanket-ed up and bedded down.</p> <p>The above squadrons will be named by the Inspector-General of Cavalry on arrival.</p> <p>Officers' chargers ... The officers' charger roll will be produced at this inspection.</p>
		<p>Inspection of horses ... Horses to be drawn up in column of squadrons.</p> <p>Interval between horses—one horse's length.</p> <p>Distance between front and rear rank—two horses' lengths.</p> <p>Distance between squadrons—three horses' lengths.</p> <p>Two troops in service marching order.</p>

2ND DAY, AFTERNOON—(contd.)

Dress—As for Stables ; no swords—(contd.)

One troop of each squadron with stripped saddles for fitting trees. Last-shod horses on the inner flank of their respective squadrons ; to be turned in when the squadrons file by.

Farriers to be on parade with their tools ready to remove any shoe.

Remounts and horses proposed to be cast to be formed up in rear of the regiment, by squadrons.

Horse-rolls will be produced at this inspection.

Horses will then file past, at one horse's length distance between the Inspector-General of Cavalry and section commanders, who will stand facing the Inspector-General of Cavalry about 20 yards off, while the horses of their sections are passing. Squadron and troop commanders will stand on the right of the Inspector-General of Cavalry.

3RD DAY, MORNING.

Drill order.

Parade and field movements.

Regimental parade for parade and field movements. This parade will conclude by the regiment going over the regimental jumps by troops in rank entire, *i.e.*, rear rank abreast of front rank, each rank being led by an officer or non-commissioned officer. Ranks to break into a trot by signal of their leaders between the jumps and again into a canter by signal. No words of command.

Parade state to be furnished.

After parade.

Sword exercise

... (1) Sword exercise at the gallop for officers and squadron sergeant-majors.

Trumpeters

... (2) Inspection of trumpeters, sounding at the gallop.

3RD DAY, AFTERNOON.	Dress—Drill order.	<p>Revolver practice (3) Revolver practice mounted, mounted.</p> <p>Pioneers ...</p> <p>Pace ...</p>	<p>Revolver practice mounted for all ranks armed with a revolver.</p> <p>Six rounds continuous practice. Distance 30 paces.</p> <p>Time, 1 minute. Four targets as laid down in the Regulations to be ready.</p> <p><i>N.B.</i>—A stop watch to be ready for Nos. 3 and 5.</p> <p>(4) Inspection of Pioneers at work.</p> <p>(5) Officers and squadron sergeant-majors trotting and galloping over the measured $\frac{1}{4}$ mile at the regulation pace.</p>
		<p>Hinds and posts (as for competition) and lime-cutting.</p> <p>Lance-post practice (as for competition).</p> <p>Mounted combat ...</p>	<p>For a regiment.</p> <p>* Hinds and posts and lime-cutting. } For (1) 1st ride of recruits. (2) A named squadron. (3) Officers.</p> <p>For a Lancer regiment.</p> <p>Lance-post practice. } For (1) 1st ride of recruits. (2) A named squadron. (3) Officers.</p> <p>Mounted combat for—</p> <p>(1) The last ride of recruits dismissed.</p> <p>(2) Winners of troop and squadron prizes.</p> <p>(3) Officers.</p> <p>(4) A half squadron to be named by the Inspector-General of Cavalry.</p>

* This practice will be performed by riding through the posts at a canter and coming back on another track at full speed, for lime-cutting.

4TH DAY, MORNING —(concl'd.)	Drill order.	Attack and Defence Attack and defence drill for— drill (for all regi- ments whether sabre or lancer).	
		<p>(1) The last ride of recruits dis- missed.</p> <p>(2) The remaining half of squad- ron named for mounted combat.</p>	
4TH DAY, AFTERNOON.	Plain clothes.	Lead-cutting	... Lead-cutting for— (1) Officers. (2) Men selected from a named squadron by Inspector- General of Cavalry.
		Single stick	... Single stick and loose play for— (1) Officers. (2) Recruits. (3) A named troop.
		Sheep-cutting	... Voluntary : but the Inspector-Gen- eral considers this such a valuable practice for any one armed with a sword that, if funds are avail- able, it should be practised.
		Tent-pegging	... With swords for sabre regiments. With lances for regiments armed with lance.
5TH DAY.	Dress—Field day order.	Detached duties	
		<p>... One whole day will be set aside for detached duties.</p> <p>The regiment will parade for recon- noitring and screening duties against an enemy, skeleton or formed.</p> <p>The Officer Commanding the regi- ment will be good enough to prepare a scheme for the above to be handed in, with a map, to the Inspector-General of Cavalry on arrival.</p> <p>When there are two or more Cavalry regiments in a station, the senior Cavalry officer will prepare a scheme for the regiments to be exercised as above in brigade.</p>	

- Reports and returns ... (1) A. F. B. 108-1—single copy.
 (2) A. F. B. 194-1—in triplicate for each officer.

The above reports to be handed in unfolded (between card-boards) to the Inspector-General of Cavalry on arrival, dated the day fixed for the regimental parade.

The attention of Commanding Officers is called to Queen's Regulations, Section V, and Army Regulations, India, Volume II, Section V, para. 207 *et seq.*; also to the notes on A. F. B. 194-1, and they are specially requested to see that the reports on officers are correctly made out and sent in—

- (a) Numerical return of horses of 18 years of age and over.
 (b) Numerical return of horses in sick lines on days of Inspector-General's arrival and departure.

In stations where there are two regiments the following will be the programme of inspection :—

- | | | |
|---|-----|---|
| 1st day—British regiment | ... | As for 1st day. |
| 2nd day Ditto | ... | As for 2nd day. |
| 3rd day { Morning | ... | Parade movements, both regiments ;
and Regimental drill, British Regiment. |
| { Afternoon | ... | Regimental drill, Native Regiment. |
| 4th day—British Regiment | ... | As for 4th day. |
| 5th day—Detached duties both regiments, | | |

6th day—Native regiment.

7th day	{	Morning, Native Regiment.	{	British regiment as for 3rd day afternoon. Native regiment as for 2nd day afternoon.
		Afternoon, oth regiments.		

8th day—Native Regiment as for 4th day.

9th day—Both Regiments ... Brigade drill and manœuvres.

Details for Native Regiments refer to Circular for Native Regiments.

**Memorandum giving the probable programme for the inspection of
Regiments of Indian Cavalry by the Inspector-General of Cavalry
in India.**

1ST DAY, MORNING.

Dress—Riding School order.

- | | | | |
|---|---|-------------------|--|
| { | { | Riding School ... | (1) Recruits dismissed riding-school since last inspection. |
| | | | (2) Remounts dismissed riding-school since last inspection. |
| | | | (3) Recruits under training. |
| | | | (4) Remounts do. |
| | | | (5) Horses 15 years of age and over, but not on the list of casters, to be paraded on a large circle, mounted. |
| | | | (6) A named squadron under its own officers. |

The Adjutant to drill the first ride of recruits, and to be ready with all information connected with every recruit and remount in school.

1ST DAY, AFTERNOON.

Dress—As for Stables ; no swords.

Inspections in the lines.	Before the inspection of horses and baggage animals there will be inspections in the lines as under :—
Saddlery and kits.	One squadron—saddlery and kits.
Cloaks ...	One squadron—cloaks.
Arms ...	One squadron—lances, carbines, and swords.
Jhools and bedding.	One squadron—horses jhooled up and bedded down.
Officers' chargers,	The above squadrons will be named by the Inspector-General of Cavalry on arrival.
Inspection of horses.	The officers' charger-roll will be produced at this inspection. Horses to be drawn up in column of squadrons. Interval between horses, one horse's length. Distance between front and rear rank, two horses' lengths. Distance between squadrons, three horses' lengths.
	One-half squadron in service marching order.
	One troop of each squadron with stripped saddles for fitting trees.
	Last-shod horses on the inner flank of their respective squadrons to be turned in when the squadrons file by.
	Farriers to be on parade with their tools ready to remove any shoes.
Inspection of baggage animals.	Baggage animals to be formed up in column of squadrons 50 yards from the outer flank of the horses. One troop on the inner flank of each squadron to parade with gear complete.

1ST DAY, AFTERNOON — (*concl'd.*)

Dress—As for Stables ; no swords.

Inspection of baggage animals — (*concl'd.*)

Remounts and horses proposed to be cast to be formed up in rear of the regiment by squadrons.

Regimental horse-roll will be produced at this inspection.

Horses will then file past, at one horse's length distance, between the Inspector-General of Cavalry and section commanders, who will stand facing the Inspector-General of Cavalry about 20 yards off, while the horses of their sections are passing. Squadron and half-squadron commanders will stand on the right of the Inspector-General.

2ND DAY, MORNING.

Dress—Drill order.

Squadron drill ... Squadrons to parade by wings at an interval of one and a half hours.

British and native officers and non-commissioned officers are expected to be able to give full instructions for squadron drill and riding-school, and to apply their knowledge of the book practically. In addition officers must be able to meet the sudden attack of an enemy from any direction.

2ND DAY,
AFTERNOON.

Dress: Drill order.

Revolver practice.

- (1) Revolver practice mounted for all ranks armed with a revolver. Six rounds continuous practice. Distance, 25 yards. Time, 1 minute. Four targets as laid down in the Musketry Regulations to be ready.

2ND DAY, AFTER- NOON — (concl'd.)	Dress—Drill order.	Trumpeters ...	(2) Inspection of trumpeters sounding at the gallop.
		Pace ...	(3) British and native officers and kote-duffadars trotting and galloping over the measured $\frac{1}{4}$ mile at the regulation pace.
		Sword exercise	(4) Sword exercise at the gallop for British and native officers.
		<i>N.B.</i> —Stop watch to be ready for Nos. 1 and 3.	

3RD DAY, MORNING. AFTER- NOON, NOTHING.	Drill order.	Parade and field movements.	Regimental parade for parade and field movements.
			Parade state to be furnished. This parade will conclude by the regiment going over the regimental jumps by troops in rank entire, i.e., rear rank abreast of front rank, each rank being led by an officer or non-commissioned officer. Ranks to break into a trot by signal of their leaders between the jumps and again into a canter by signal. No words of command.

4TH DAY, MORNING.	Plain clothes.	Heads and posts, and	Heads and posts for a sabre regiment,
		Lance-post practice (as per diagrams circulated).	or Lance-post practice for a lancer regiment for—
		(1) First ride of recruits.	
		(2) A named squadron.	
		(3) British and native officers.	

4TH DAY, MORNING—(conclud.)

Plain clothes—(conclud.)

Mounted combat.

Mounted combat for—

- (1) The last ride of recruits joined the ranks.
- (2) Winners of troop and squadron prizes.
- (3) A named half-squadron.
- (4) British and native officers.

Attack and defence drill for—

Attack and Defence drill (for all regiments whether sabre or lance).

- (1) The last ride of recruits joined the ranks.
- (2) The remaining half of squadron named for mounted combat.

4TH DAY, AFTERNOON.

Plain clothes.

Lime-cutting...

Lime-cutting (four cuts on the right) and tent-pegging with swords for a sabre regiment, or

and

Tent-pegging...

Tent-pegging for a lancer regiment for—

- (1) The last ride of recruits joined the ranks.
- (2) A named squadron.
- (3) Any men the regiment may wish to show; and all the above practices for—
- (4) British and native officers:

Lead-cutting...

Lead-cutting for British and native officers and kote-duffadars.

Sheep-cutting...

Voluntary, but the Inspector-General considers this such a valuable practice for any one armed with a sword that, if funds are available, it should be practised.

5TH DAY.

Dress—Field-day order.

Detached duties, One whole day will be set aside for detached duties.

The regiment will parade for reconnoitring and screening duties against an enemy, skeleton or formed.

The officer commanding the regiment will be good enough to prepare a scheme for the above to be handed in, with a map, to the Inspector-General of Cavalry on arrival.

When there are two or more Cavalry regiments in a station, the senior Cavalry officer will prepare a scheme for the regiments to be exercised as above in brigade.

Subaltern's packing kits. An opportunity will be taken of inspecting subaltern's packing kits at the mess in plain clothes.

Reports and returns—

- (1) Confidential report on officers, I. A. F. 48-A., in duplicate for each officer.
- (2) Confidential report on probationers, A. F. B. 194—1., in triplicate.
- (3) Confidential report on the regiment, I. A. F. 113, in quadruplicate.

N.B.—The officer commanding is requested to give the answers to questions not marked with an asterisk, as far as he can, on a separate sheet of paper for the guidance of the Inspector-General of Cavalry. The above to be

handed in *unfolded (between card-boards)* to the Inspector-General of Cavalry on arrival, dated the day fixed for the regimental parade.

- (4) Inspection returns, I. A. F. 113-A., in triplicate, dated and handed in *unfolded (between card-boards)* the day of the regimental parade.

The attention of officers commanding is called to Queen's Regulations, Section V, and Army Regulations, India, Volume II, Section V, para. 207 *et seq.*; also to the notes on I. A. F. 48-A., and they are specially requested to see that the reports on officers are correctly made out and sent in—

- (a) (1) Numerical return of remounts, showing separately number under 4 years old when purchased.

Numerical return of horses 14 and 15 years of age and over.

Numerical return of horses 18 years of age and over.

Numerical return of horses proposed to be cast.

Numerical return of horses in sick lines on

days Inspector-General of Cavalry's arrival and departure.

- (b) Statement of the Chanda Fund, showing the realisable cash balance in hand.
- (c) Return showing total weight (giving details) carried on the sowar's horse in heavy marching order; also on pony in field service order including extra blankets for cold weather.

Orderlies ... The Officer Commanding will be good enough to detail one mounted and one dismounted orderly each for the Inspector-General of Cavalry and his Brigade-Major.

At stations where there are two regiments, the following will be the programme of inspection :—

1st day.— }
2nd day.— } British Regiment.

3rd day { *Morning*.—Parade movements, both regiments; Regimental drill, British Regiment.
 { *Afternoon*.—Regimental drill, Native Regiment.

4th day.—British Regiment.

5th day.—Detached duties, both regiments.

6th day.—Native Regiment, as for first day.

7th day { *Morning*—Native Regiment, as for 2nd day (morning).
Afternoon.—Both regiments British Regiment, as for 3rd day (afternoon). Native Regiment, as for second day (afternoon).

8th day.—Native Regiment, as for fourth day.

9th day.—Both regiments, Brigade drill and manoeuvre.

Details for British Regiment refer to Circular for British Regiment.

NOTES FOR THE RECONNAISSANCE FIELD-DAY.

1. All information as to the general and special idea to be previously disseminated amongst the troops concerned.

2. Rough *précis* showing proposed lines of advance of the advanced squadrons, together with approximate hours of arrival at the most important places *en route* to be handed to the Inspector-General of Cavalry the day before the reconnaissance.

3. Similar information to be furnished by officer commanding enemy.

4. Distinctive dress to be worn.

5. Commanders of officers' patrols to be given distinct orders as to zones they are to search. They should start at least one hour before the advanced patrols and should only concern themselves with formed bodies of the enemy of not less strength than squadrons.

6. Skeleton forces will be represented by distinctive flags, showing their rear frontage and keeping their proper distances and intervals :—

1 Troop	shown by	2 white flags.
$\frac{1}{2}$ Squadron	"	2 blue "
1 Do.	"	2 red "
1 Battery	"	2 (red and blue) flags.
1 Battalion	"	2 (red and white) "
Scouts or Patrols	"	(black and white) "

7. A diary of the messages to be kept by the Staff Officer (Adjutant) and an hourly map, showing the position of the defending and enemy's forces at the end of each hour as reported, to be handed to the Inspector-General of Cavalry at the end of the reconnaissance. For these maps use coloured chalks and squared paper—accuracy only important.

8. Open order to be kept when moving over troops.

9. The pace of the trot not to be exceeded except by officers' patrols, for urgent messages and the last 200 yards of an attack : rallies as quickly as possible.

An average rate of advance of 5 miles an hour including halts for checking purposes expected.

10. Important messages to be sent in duplicate, one direct to Officer Commanding Reconnaissance, one to Officer Commanding squadron.

11. Inferior forces in screening line should not attack superior ones, but should give way, resuming original formation as soon as pressure relieved.

12. Prisoners not to be taken.

13. Suitable ground should be manœuvred for (if available) previous to the final engagement.

*Comparative Table of Cavalry Paces of foreign nations stated
in miles per hour.*

Country.	Slow walk.		Manœuvre walk.		Heavy Cavalry walk.		Light Cavalry walk.		Trot.		Trot out.		Canter.		Manœuvre gallop.		Extended (charge) gallop.		REMARKS.
Italy ...	2.79	3.72			..	..	..	..	7.45	9.32	† 7.42	12.37	16.72						† Riding-schools.
Austria	4			..	..	..	..	8.4	..	..	\$ 14.0	..						\$ "Kurzer Gallop" which a line assumes from the trot preparatory to the gallop, previous to the "carrière" or charge.
France		* 4.45	† 3.71	8.9	..	..	..	..	12.61	16.32						* For big horses. † For small horses.
Germany	..	3.8			..	..	7.6	..	..	..	..	14.9	21.82						
Russia	2.9			..	..	7.84	..	..	..	..	10.56	16						|| When manœuvring in open ground under fire.
America	(?)			(?)	8	12	16						
England and India.	..	4			..	..	9	9	9	9	9	15	..						

SECTION XXII.

* RULES FOR COMPETITION FOR SWORD AND LANCE PRACTICE.

DURING the hot season of the year, from 15th April to the 15th October, squadron commanders should practise their men in the use of the sword and lance, at least on two occasions weekly; every man to be put through a course of "attack and defence" drill each hot weather before being allowed to commence loose play mounted.

Between the 1st and 31st December yearly, unless prevented by some unavoidable reason, squadron commanders will hold competitions in their squadrons to determine the best man in the squadron.

The 3rd prize for the best man in a half-squadron will only be awarded when at least two-thirds of the strength, exclusive of recruits, and men on furlough and detached duty, have competed.

The four winners of the squadron prize will compete for the prize given to the best man at arms in the regiment. This competition being judged by the Commanding Officer.

* NOTE.—*Vide* G. O. 73 of 1896.

No man is to hold two prizes, so in the case of the squadron winner gaining the regimental prize, the next best man will be entitled to the squadron prize, and in the same way the next for the half-squadron prize.

Any men who from age or other infirmity the squadron commander may consider should be exempted from these practices, should be brought before the commanding officer, who alone has the power of granting exemption.

Rules for the "Assaults."

1. The names of the competitors are to be entered in the Squadron Roll (Form A).

2. The men are to contend mounted, with masks.

3. The competitors are to draw lots as to who are to contend together, each couple, one armed with a single stick, and the other with a dummy lance, standing facing each other on opposite sides of a circular arena, will receive the commands "left turn," "canter," "march," and when steady, "attack," when they will attack each other; or an open manège is permitted at the discretion of the officer commanding, when the pair will advance from opposite ends on the command "attack," "march."

When a point or hit is made, they are to be stopped by the word "steady" from the officer superintending, and will change weapons.

Nothing in the nature of counter-hitting or counter-pointing will be credited as a win to either competitor.

Counter-hitting and counter-pointing for the purpose in view may be defined as follows :—

I.—Those hits and points which are delivered simultaneously.

II.—Those hits and points which are actually delivered in succession, but so rapidly that neither umpire can call “steady” before the delivery of the counter-stroke.

4. The senior British officer of the squadron will act as superintending officer and referee, assisted by two other officers, British or Native, as umpires.

5. There are to be three separate rounds or “attacks” in each “assault,” unless the same man wins the first two attacks, in which case a third attack is unnecessary. In the third attack both will be armed with single sticks or dummy lances according as the regiment is a sword or a lancer regiment.

6. The letter W is to be entered in ink at the time of the competition against the name of the man who wins each “attack,” and a stroke is to be drawn opposite the name of the loser. On the completion of each “assault” a line in red ink is to be drawn through the name of the loser.

7. Those who win the first “assault” will again draw lots and compete as before, the competition being

continued till the combatants are reduced to a single pair.

8. The winning man in each squadron will compete for the Regimental Prize in the same manner.

9. When the entire competition is concluded, a general Regimental Return is to be made out according to Form B.

10. Decided cuts and points are to count equally. The point and the side of the stick corresponding to the edge of the sword and the point of the dummy lance are to be chalked. Cuts and thrusts delivered otherwise than with the edge or point of the weapon do not count.

11. Lances and sticks for this practice must be of the regulation length, and the lance held at the balance. Hits and points must be above the waist. Any horse leaving the enclosure, the rider to lose that "attack."

12. All "attacks" must be continued until one or other of the umpires shall call "steady." The superintending officer, however, may at any time order the competitors to commence the "attack" afresh.

13. If a man be unhorsed, he will lose the attack. If his horse fall, the supervising officer is to decide whether the fall has occurred through bad riding or unavoidable accident. In the former case the man will lose the "attack," in the latter he will incur no penalty.

14. If a man drop his sword or lance, and is able to recover it without assistance and win the attack, he shall have a right to do so; but he is not allowed to fight on foot. If a man strike his opponent's horse, his opponent is to score the "attack."

15. The Squadron Returns are to be preserved until the next year's competition shall have been gone through, when they may be destroyed if no longer required.

16. It is desirable that every man should ride his own horse in the competition, but care should be taken that timid and vicious horses are not ridden in these encounters, but after proper training at "attack and defence" drill there should be few of these.

17. In class regiments the competition should be carried out by squadrons. In class half-squadron regiments, commanding officers are at liberty to use their discretion as to carrying it out by half-squadrons, the winners of the two halves of a squadron contending for the Squadron Prize.

18. Commanding officers should take measures that every recruit before dismissal be thoroughly instructed, first in "attack and defence" drill, and afterwards in loose play, so that he may be prepared to enter for these encounters.

FORM A.

*1st Squadron**Regiment of**Dated at**the of 189*

Result of competition for squadron and half-squadron prizes for the year :—

Regiment No.	Rank and Name.	* 1st Assault.		
		1	2	3
560	Dupfadar Ram Singh ... ..	...	W	...
234	Sowar Prem Singh	W	...	"

FORM B.

*Prizes for
of**Practice**Regiment**Annual Return of**Practice*

the above corps, showing by half-squadrons the men eligible for prizes, and the competition for the Regimental Prize.

* The same form for subsequent "assaults," only substituting 2nd or 3rd assault to completion.

Station dated of 189 .

Troop.	STRENGTH OF SQUADRON.*			NUMBER COMPETING.			Plus or minus of $\frac{1}{2}$ of strength.	Rank and name of winner in each troop as shown by squadron (or $\frac{1}{2}$ Squadron) Return.	Recommended for	REMARKS.
	Non-Commissioned Officers.	Trumpeters.	Lance-Duffadars and Sowars.	Non-Commissioned Officers.	Trumpeters.	Lance-Duffadars and Sowars.				
A	9	1	64	6	1	49	56 + 4	Duffadar Khobi Ram.	Regimental Prize.	
								Sowar Lall Singh.	$\frac{1}{2}$ -Squadron Prize.	
B	9	1	50	7	1	30	38 + 2	Lce. - Duffadar Prem Singh.	Squadron Prize.	Prize not admissible.
C	8	1	58	8	...	54	62 + 17	Sowar Ram Singh.	Squadron Prize.	
								Duffadar Khushi Ram.	$\frac{1}{2}$ -Squadron Prize.	
D	9	...	60	7	1	52	60 + 14	Lce. - Duffadar Fateh Singh.	$\frac{1}{2}$ -Squadron Prize.	

* Deducting recruits not joined the ranks.

SECTION XXIII.

SYSTEM OF CARRYING OUT LANCE AND SWORD TENT-PEGGING PRACTICES.

THE following method of carrying out the above is recommended by the Inspector-General of Cavalry in India.

The ground, where available, is marked out in eight runs as per diagram attached.

The practice is by sections of eight men, four front rank and four rear rank, consecutively. Assuming the practice ground is on the left front, the squadron marches up parallel to line A, B, C with its left on A; at 50 yards from A, the left half-squadron halts; the right half-squadron continuing its march; left about wheels and halts, covering with its right the markers A A; also at about 50 yards distance.

The two half-squadrons are now symmetrically placed, exactly facing one another each at 50 yards from the base line flags A A.

The half-squadrons now get the order "From the right and left of fours to the front file" respectively, "Halt": "Trail Lance."

On the peg line are two rough riders with a small flag each, also four syces each—one per peg.

When the pegs are ready, the rough rider hoists his flag from the centre of his set of four. The syces clear out to centre street.

The hoisting of the rough rider's flag is the signal to the senior man of each four opposite the base flags that the pegs are ready and ground clear.

He gives the word to his four men "Walk march"—the men file out straight to the front, covering correctly: as the leading men arrive opposite the further peg of the four, the senior gives the word "Right or Left turn" (according to his half-squadron) "Gallop."

As the men turn, if they file out correctly; each will be opposite his own peg.

The four men dress to the centre, increase their pace together, take their pegs and gradually, without further word of command, decrease their pace and close to centre.

On arriving at "C" flag line, they assume the "Walk," wheel outwards about clear of the running ground and re-form on outer flank of their half-squadron and await their turn for next run.

As each set of four front rank leave the base, the rear rank set of four advance into places vacated and await the flag signal.

After each rear rank set of four moves clear, the remainder "Inwards Pass" and cover flags A A; so that each set of four men leaves from the same ground.

The rough rider with flag moves to centre street as soon as he sees the senior man of each four acting on his signal,

One officer from each half-squadron stands in the centre street on the A A line to see his men file out smoothly on getting the rough rider's signal, that they cover correctly, that the rear rank or next set of four men move up as the front rank four move out, and that the remainder pass and close correctly and quietly await their turn.

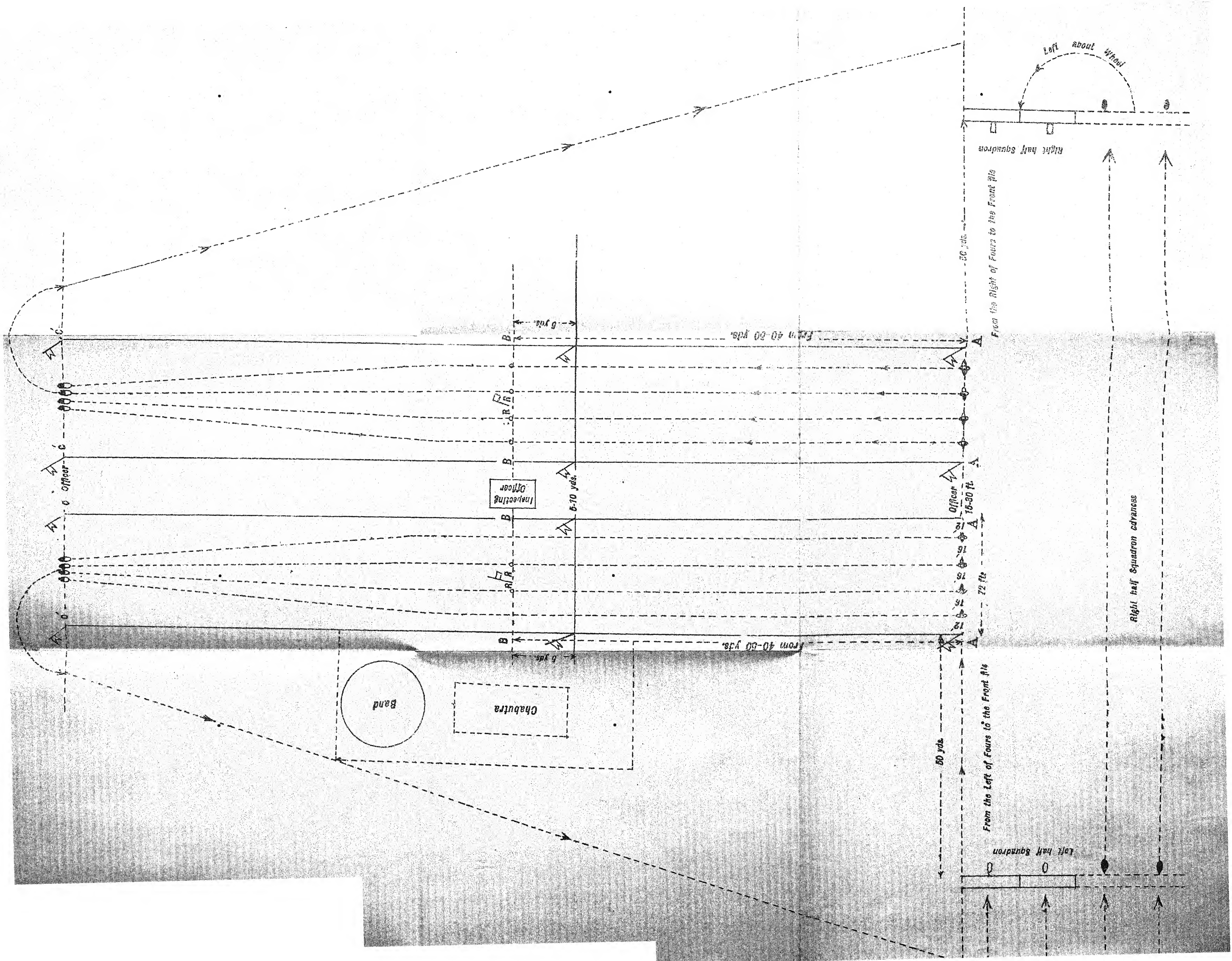
Another officer from each half-squadron proceeds to the C C flag line to see each set of men arrive, that they close to centre evenly and decrease the pace gradually and do not wheel off the running ground until the "walk" is assumed.

The detail of the Lance flourish after turning on to the runs is left to Regiments ;—after taking the peg, and on decrease of pace, the Lance should be brought to the trail.

The advantages claimed for this system are :—

1. The men get practice with their service Lances.
2. The horses stand at the bases awaiting their turn, in most cases quite quiet and cool.
3. The men must ride their horses to carry out the practice.
4. The system saves the horses' mouths, hocks and sinews.
5. The men get the greatest number of runs in the shortest time.
6. Inferior horsemanship or clumsy handing of weapons cannot pass without detection.

N.B.—The small flag 15 feet from the Peg line is the point where the Lance is to be lowered for aim at the peg, on no account before.





It is purposely placed close to get the men accustomed to aim correctly and quickly.

In the field it is obviously unsound for a Lancer to engage his point for any length of time before using it, as a false step on the part of the horse or any inequality in the ground may result in the point catching before the thrust is delivered.

If this happens the point is certainly blunted and the weapon may be jerked out of the hand at the expense of a sprained wrist. A Lancer should be as careful of the point of his Lance as he is of the edge of his sword.

SECTION XXIV.

INSTRUCTION IN THE USE OF THE SWORD— MOUNTED.

THE Inspector-General of Cavalry in India considers that to enable a mounted man to use his sword effectively at speed, it is necessary he should be thoroughly instructed in the value of timing his cut and in the correct delivery of the edge of the weapon, as under:—

"TIMING."

If we take an uninstructed man and ask him to cut 2 to the right and 1 to the left at speed at a stationary object, for instance, a suspended sheep, the probabilities

are he will deliver his cut in the air as he does not appreciate the speed his horse is moving at, and the necessity for the "time" allowance.

The initiatory instruction may be given with a single stick, (if the regiment is armed with a straight sword, remove the guard,) select a convenient object—a sheep-skin stuffed with horse-hair is as good as anything, suspend it to the right height and let the pace be moderate to start with until the timing the cut to a nicety on both sides is a certainty.

By degrees increase the pace and vary the height of cut until eye and hand act in unison.

At the same time the men should be instructed in—
"The Delivery of the Edge."

This is more easily taught on foot with a regimental sword, without the edge on; pillars of sifted earth, or potter's clay (made into a thick paste), should be erected, the bases may be permanent, put up at convenient distances and height and the men "set" to cut at them as if on horse back. A block saddle of wood is an advantage, as the management of the legs can be supervised; but this, if expense is an object, is not absolutely necessary.

After each cut the individual error in delivery is at once apparent and easily rectified.

In practising cut one on the left horizontally at Cavalry, it will be seen it is impossible to deliver the edge leading through more than a very limited sector of the horizontal plane, *i.e.*, about 30 degrees of the left front, after that if the cut is prolonged the wrist has a natural tendency to turn over and drop. Consequently

the edge turns and falls also and the value of the cut commences to cease directly the correct plane is left.

Attention should be called to this fact, as it is of very great importance in the attack over the bridle arm.

The horizontal cut to the left is unknown to the Asiatic swordsman; an examination of the sword-hilt in use with them will at once show its impracticability. The hilt is made to fit the hand tightly, the edge being thus aligned with the line of knuckles when the hilt is gripped.

"Draw" is the result of the stiff wrist and arm cut, the outcome of the rigid position of the hand and grip in delivery.

The left front cut of the Asiatic swordsman is delivered with a stiff wrist and arm at a downward angle which is nearly 45 degrees to a perpendicular line drawn from the ground through the horse's head. The position of the bridle fore-arm and upper part of sword-arm at the termination of the cut prevent the sword from leading too far on the original line of delivery, thus obviating any possible injury to either horse or man on near side.

This stroke is a drawing chop, the body at the time being swung round in the saddle from the waist, the left leg drawn back, both thighs gripping, the right leg turned heel out, using knee as a pivot. It is a most effective stroke when the knack is picked up, a sheep being easily severed over the bridle arm, the accepted weak point of the mounted swordsman.

In practising this cut ride a line close to the object to be cut so as to get on to the blade as near the hilt as possible, and do not be afraid of cutting too soon.

SECTION XXV.**RECONNAISSANCE COURSE.**

THE following course of instruction in reconnaissance recommended by Lieutenant-Colonel J. Nixon, 18th Bengal Lancers, will be found invaluable.

105. The leading idea is that men should be able to read and use maps and find their way about, but not that they should make maps or sketches. That would be a continuation of this course.

All work on foot is to be considered as a preparation for work mounted—the latter only being of any use.

SCALES.

N.B.—The making of Scales is *not* to be taught. Explain that so much paper represents so much ground, a proportion which can be varied as wished, *e.g.*, 1 inch to 1 mile or 6 inches to 1 mile—the larger the scale the more paper it takes up, and hence the more detail shown.

The maps issued at Camps-of-Exercise or on Service are seldom or never larger than 1 inch to 1 mile, the same size as the Q.M.G.'s maps of country round every Cantonment.

Show the men a foot-rule or paper divided into inches, half inch and $\frac{1}{4}$ inch, and question how much ground the divisions represent at all sorts of scales.

Apply to a map, and ask how far objects are apart at any scale.

Then reverse the operation and ask, two objects (villages) being $\frac{1}{2}$ mile apart on map, at a certain scale how far apart would they be on paper or on a map, and then give actual objects on and verify from a map.

MAGNETIC COMPASS.

Not *Prismatic* compass but ordinary open watch pattern. Neglect the variation as it is only 3° East in the North of India.

Explain that the magnetism always causes card to point to the North, then how graduated from North 0° to 90° East and South 180° etc, 90° in each quadrant.

Explain "bearing"—"angular distance from magnetic North"—or angle formed at eye of observer by one line towards object observed and another to North through the N.P. on the card. Men to observe bearings of objects visible, until able to do so fairly correctly, bearings to be checked by instructor with a prismatic.

N.B.—It is useless to worry about small inaccuracies, they don't matter, as this table shows—

Length forward bearing.	Error caused by taking a bearing wrong by			
	1°	2°	3°	1 point $11\frac{1}{4}^\circ$
100 yards	... $1\frac{3}{4}$ yds.	$2\frac{1}{2}$ yds.	$5\frac{1}{4}$ yds.	
300 "	... $5\frac{1}{4}$ "	$10\frac{1}{2}$ "	$15\frac{3}{4}$ "	
500 "	... $8\frac{3}{4}$ "	$17\frac{1}{2}$ "	26 "	
1,000 "	... $17\frac{1}{2}$ "	35 "	52 "	
1 mile	... 31 "	62 "	93 "	
5 miles	... 150 "	310 "	465 "	

Next, instructor to give a "bearing" and men to point out its direction—as N. 40 W.S. 20 E., etc., and also by the points by the compass which the men should learn. N.E. by E, South and by West, etc.

Make a N.P. on any sheet of paper in any direction. Lay compass on it and turn paper round till both paper N.P. and compass N.P. coincide.

Make the men draw by estimation on the paper the direction of the bearings asked, (*not* with a protractor,) the bearings should be by points first and then by degrees and on the line so drawn, mark off various distances at various scales, and question on them.

Note for Instructor.—Don't waste time on needless accuracy.

The smaller the scale, the less detail and the more you can judge by eye. All distances under 50 yards at 6 inches to a mile which takes up 17 inches of paper must be judged: this amount of paper at 1 inch to a mile would represent 300 yards, so don't break the men's hearts by insisting on a useless accuracy.

Repeat last two paragraphs on a real map of country round.

CONVENTIONAL SIGNS.

Describe importance of reconnoitring, and show how much more useful the trained-man must be. Explain, that to save labour and ensure uniformity, we have resolved to show water, roads, railways, villages, etc., in a particular way, and hence they must learn these to be able to read our maps. Show the conventional signs

and compare them with the ground : particularly everything that is applicable to India, and explain the likeness.

Questions in this to be continually asked.

Rule lines through maps, and ask (1) bearing of line, (2) all objects passed, (3) distance between the objects at any scale you like.

Repeat on actual map of country round station. Take the men *out* along the line and let them identify each place on the map, and compare how represented.

Show what value each has in a military sense, ditches, bridges, canals, irrigation cuts, crops passable or impassable (wheat and sugar-cane, etc.) nullahs where crossable, water, ponds, rivers, wells, how horses and men could be watered. Camping-grounds, grass, grain, karbi, etc., railway bridges (for destruction), crossing places over and under bridges and level crossings. Compare information required under reconnaissance in Cavalry Drill Book. The men must draw the conventional signs or they won't know and remember them.

Make and give the men a map, first at a large scale, say, 6 inches to a mile, and later at small scales, of a road, showing 2 miles' length and all turnings, etc.

Make them hold the map so that the road on the map points in the direction of the real road, place compass on map and mark the N.P.

Make them walk on foot and mark on it conventionally all bridges, trees, villages, etc., they come to, *using the foot-rule and not a scale on a protractor.*

The following show the distances shown by inches and $\frac{1}{2}$ inch and $\frac{1}{4}$ inch at various scales and what the men can assume them to be. Again, on *worrying after a finicking accuracy, it is unpractical and not required. the error in the true number of yards is less than what all men make by bad pacing and counting wrong* :—

6"=1,760	4"=1,760	3"=1,760	2"=1,760	1"=1,760
3 = 900	2 = 900	1½ = 900	1 = 900	½ = 900
1½ = 450	1 = 450	1 = 600	½ = 450	¼ = 450
1 = 300	½ = 200	½ = 300	¼ = 200	
½ = 150	¼ = 100	¼ = 150		
¼ = 75.	In all cases, assume the mile to contain 1,800 yards.			

The men must mark all they see on the map and send in a written report, as short as they like on the form given in the text-book (Richards), or adapted as desired.

All this is preparatory to working mounted. Now the scale of horses' paces comes in and this some officer must make, if required, but it need not be made at all.

Most C.-B. horses average about 1,800 walks and 600 trots per mile.

The maps will now be required at small scales, as the distances will be more.

Each walk counted *two* when leading fore comes to the ground, and each trot one "rise" in the saddle not bumping.

The canter is unreliable without great practice. Assume each horse's paces at 1,800 walks 600 trots, then at the

various scales, you will possibly want, the divisions will represent these distances, *quite near enough*, not only for reconnaissance but for any sketch by an officer also.

Walks 1,800 = per mile at 3", 2" and 1" to a mile—

3" = 1,800	2" = 1,800	1" = 1,800
$1\frac{1}{2}$ = 900	1 = 900	$\frac{1}{2}$ = 900
1 = 600	$\frac{1}{2}$ = 450	$\frac{1}{4}$ = 450
$\frac{1}{2}$ = 300	$\frac{1}{4}$ = 225	
$\frac{1}{4}$ = 150		

Trots 600 = per mile at 3", 2" and 1" to a mile—

3" = 600	2" = 300	1" = 600
$1\frac{1}{2}$ = 300	1 = 150	$\frac{1}{2}$ = 300
1 = 200	$\frac{1}{2}$ = 75	$\frac{1}{4}$ = 150
$\frac{1}{2}$ = 100	$\frac{1}{4}$ = 40	
$\frac{1}{4}$ = 50		

Any distances under these to be estimated from foot-rule. This saves making any scale at all.

It may be more important to get information about a route quickly and be even a mile out in 15 miles than to waste time over a scale and perhaps be too late to be able to get the information.

Give the men small scale maps, and give them each a separate bearing to go on, 5 miles each, which they are to measure and mark off.

They should mark on the map all they see and add a report. *Pace to be at least 6 miles an hour and no cantering.* They must count their horses' paces for their dead-reckoning distance to enable them to mark on the map the places where they come across bridges, roads, nullahs, etc., in fact anything to be noticed.

Given a village 5 miles off to get to, they should go there *and be back* within $1\frac{3}{4}$ to 2 hours and hand in their information on the map and on their report, within $\frac{1}{4}$ hour of arrival, all in pencil and written on the knee.

Practice along roads, rivers, nullahs, railways etc., and finally, the class told off as commanders of patrols, as if sent out from a contact squadron, each patrol being given a frontage of 1 mile to $1\frac{1}{2}$ miles and a certain direction, past villages, etc., and also on a bearing. Length, say, 6 miles, all patrols to rendezvous at 6-mile point, write reports, and hand in to Troop Commandar there in $\frac{1}{4}$ hour, and back to Head-Quarters in another hour.

N.B.—No reports to take more than 2 sheets at most out of the official book for scouts' reports in the field, roughly 5 inches \times 3 inches.

The headings for roads and rivers are different—

Across country should merely show,

Water and means of watering men and horses,

Obstacles,

Defiles,

Anything to impede rate of marching,

Or interfere with manœuvring,

Point out passages on nullahs and rivers, etc.

Reports during a reconnaissance by a force advancing, and more generally at any time, are useless unless made out and *sent back* quickly.

In all this, there is no question of map-making but only of finding their way by a map and a compass and enough of scales to understand that a certain amount of paper represents a certain amount of ground, and above all, no useless worrying and attempts at absolute accuracy, which is not attainable under a long and elaborate education.

SUMMARY AND SYLLABUS.

CLASSES 6 OR 8 MEN.

Course.

Scales 2 days.	} This is the ground work and must not be slurred over, go through it again and again, although the men may seem to understand.
Compassing and bearings	...	... 2 days.
Conventional signs	...	... 2 days.

Marking places and signs on a simple short map—2 days.

Scale of horses' paces applied to ground—1 day.

Using short simple map on horseback and	} 3 days.
writing elementary reports ...	

Practising across country, roads, rivers,	} 1 week.
railways, etc., longer distance on small	
scale map ...	

Total 3 weeks,

and practice continued afterwards.

Men should be off all duty and do at least 5 hours' work daily in the morning, so that they can do evening stables.

Make some officer examine at the end, in the practical part particularly.

The men who have done this might go on to make maps, regular sketches, if it be thought worth while.

SECTION XXVI.

SCOUTING.

Colonel Baden-Powell, 5th Dragoon Guards, says in his most interesting and instructive book, the "Matabele Campaign, 1896," that the best lesson he learnt in that campaign was the art of "Scouting." He has sketched the principal points about it briefly as follows, which will serve as a valuable guide to all regiments:—

"I hardly know of a fight in history of which the result was not in some way due to good or defective preliminary reconnaissance; and the important art of scouting is not to be learnt in a day, and its elements ought to be, and could be, practised by everybody in peace time. One can train one's-self in peace by educating the mind in two essential particulars. That is how it struck me. I may be wrong; but I found it useful in my own case to have practised myself in the two following points: one is the habit of noticing

every little detail, and the other is practice in putting those details together and reasoning out their meaning; the art of spotting things in the first instance, and then of putting this and that together and drawing your conclusions from them. Now if you go across country with a trained scout, his eyes will be everywhere; he will notice little tiny signs on the ground at his feet, or other signs in the far distance; he will notice details that you can hardly see yourself, and he will read them out in a moment and tell you what, as a whole, they mean; he reads them just as you read the page of a book. An uneducated man will ask you, "How do you know the book says that?" "Well," you reply, "here it is: this letter and that letter make up a word, these words make sentences, and the sentences make sense, and that is how I gain the information from this page." In the same way the scout sees such small signs as four broken twigs, or a bent blade of grass, which form the letters, and several of them, put together, form words and sentences sufficient to give him full information. I will give you an example of what I mean. I was out scouting with my native boy in the neighbourhood of the Matapos. Presently we noticed some grass-blades freshly trodden down. This led us to find some foot-prints on a patch of sand; they were those of women or boys, because they were small; they were on a long march, because they wore sandals; they were pretty fresh, because the sharp edge of the foot-prints were still well defined, and they were heading towards the Matapos. Then my nigger, who was examining the ground a short distance away from the track, suddenly started, as Robinson Crusoe must have done when he came on Friday's

foot-mark. But in this case the boy had found, not a foot-mark, but a single leaf. But that leaf meant a good deal; it belonged to a tree that did not grow in this neighbourhood, though we knew of such trees ten or fifteen miles away. It was damp and smelt of Kaffir beer. From these two signs, then, the foot-prints and the beery-leaf, we were able to read a good deal. A party of women had passed this way, coming from a distance of 10 miles back, going towards the Matapos, and carrying beer (for they carry beer in pots upon their heads, the mouth of the pot being stoppered with a bunch of leaves). They had passed this spot at about 4 o'clock that morning, because at that hour there had been a strong wind blowing, such as would carry the leaf some yards off their track, as we had found it. They would probably have taken another hour to reach the Matapos, and the men for whom they were bringing the refreshment would, in all probability, start work on it at once, while the beer was yet fresh. So that if we now went on following this spoor up to the stronghold, we should probably find the men in too sleepy a state to take much notice of us, and we could do our reconnaissance with comparative safety. So you see there is good deal of information to be picked up from merely noticing two small objects, such as crushed blades of grass and a single leaf, and then reasoning out their meaning.

And these two habits of mind are what every man can practise in peace time. Houdin, the conjuror, used to train his son to notice and remember things in a shop window to such an extent that, after taking one look, he could away and tell you every object that was

shown in the window. This was developing the "prehensibility of mind" which is necessary for a scout. Then, for instances of "inductive reasoning," one cannot do better than read the "Memoirs of Sherlock Holmes," and to practise the art on similar lines. A scout, to be of any use, must have absolute confidence in his abilities, and his abilities will be largely the outcome of practice in peace time.

TRAINING OF SCOUTS.

The following is briefly the system pursued in the 5th Dragoon Guards of training scouts, by Colonel Baden-Powell:—

In the first instance the men are selected, from those who volunteer for it, for the following qualifications, —

General intelligence, smartness, good character, good eye-sight and hearing.

Health and soundness (especially as regards venereal and drink).

Ability to turn their hand to any work.

Ability as riders.

Ability as swimmers.

Preliminary education. They are then thoroughly grounded in —

Map reading.

Map making.

Reporting (verbally and in writing).

Respective duties of combat patrols and reconnoitring patrols.

Then they are further trained as scouts (in classes of 6, not more) in the following Special training. special points—in which self-training and practice are the important steps to success :—

1. *Finding the way* in a strange country by day or by night by map, by memory of map, by compass, stars, landmarks, questioning natives, etc.
2. *Quickness of eye and ear* by day and night, noting small signs, keeping memory record of landmarks, features, etc.
3. *Keeping hidden one's-self*.—Selection of background, etc. Hiding by day, by night.
4. *Tracking*.—Elementary instruction in tracking men, horses, etc., according to soil, weather, etc.
5. *Deducing information* from tracks and signs *à la Sherlock Holmes*.
6. *Riding across country*.—Obstacles, crossing rivers, estimating distances, etc.
7. *Care of self*.—How to keep fit. Bivouacking, cooking, etc.
8. *Care of comrade*.—First aids to wounded or sick. How to carry on one's back. How to carry on a horse.

9. *Care of horse*.—Saddle fitting. Shoeing. Detection of sickness or lameness, prevention and cure. Feeding, and general management of horse.
10. *Sketching*.—Rapid sketching. Sketching from memory. Sketching by night. Judging distance, height, etc.
11. *Reporting*.—Rapid reporting. Reporting distant information. Verbal reports of near information.

After thorough instruction in the above the scout is put through in practical work in varied scouting exercises over varied country in pairs and individually.

For this purpose there are scouting competitions as follows :—

1. "*Spider and Fly*."—A patrol go out into a given tract of country, several miles in extent, conceal themselves, and report moves of enemy ("Spider"). Enemy's patrols go out and endeavour to find hidden patrol ("Flies").
2. "*Lamp or flag stealing*."—Two sides form opposing outposts a few miles apart, with flags or Chinese lanterns (according to time of day or night) to show the positions of their (imaginary) supports. Scouts reconnoitre and report position of enemy's outposts and, if able, steal flags or lamps—to show they have discovered the position of the supports, etc.

3. *Rapid Sketching and Tracking*.—A patrol visit given points, sketching and reporting. A hostile patrol endeavour to track and overtake them, within given boundaries.
4. *Chart and Compass Race*.—As per Regulation.

Detailed rules for the above competitions have been drawn up so that exact marks can be assigned and satisfactory awards made;—*vide* Colonel Baden-Powell's "Handbook to Scouting."

On passing the above tests and an examination satisfactorily, scouts are given a Scouts' Badges. distinguishing badge to be worn on the arm. They are mounted on selected horses. They carry no arms, but a pistol. They ride in the rear rank of their squadrons on parade, and are used whenever a combat or reconnoitring patrol is required.

Scout's badge is a "North Point" fleur-de-lys made of brass about $2\frac{1}{2}$ inches long.

N.B.—Colonel Baden-Powell's "Handbook to Scouting" and "Scout's Note Book" in English and Vernacular will shortly be published.

SECTION XXVII.

RULES FOR THE CONDUCT OF THE CHART AND COMPASS PRACTICE.

1. THE Chart and Compass Practice will be conducted on the following lines, and, when feasible as an adjunct to, and in combination with, the long reconnaissance,* one or two extra days, as required, being assigned for the practice so as not to encroach on the time to be spent on the reconnaissance :—

* G. O. C. C. No. 645 of 1896.

- (a) The practice will be performed by patrols, each to consist of one officer and 12 non-commissioned officers and men.
- (b) At least two patrols per squadron must be detailed. In Native Cavalry Regiments one patrol should be commanded by a British † officer when available, the other by a native officer.
- (c) The reconnaissance of a certain tract of country, with the aid of the compass, and the transmission of intelligence gathered *en route* to a point in the rear.

† Only subaltern officers are required to perform this duty.

The compass may be of a simple pattern with the bearings clearly marked in degrees which will be more easily read, specially by natives, than the cardinal points.

- (d) The preparation of a report and rough sketch of the country traversed, also of a position held by a flag enemy of all arms when formed bodies of troops are not available.

(Attention is drawn to Cavalry Drill, Part IV, Sections 5 and 6, and Part V, Section 8. It would facilitate the preparation of sketches were paper ready ruled to square taken on the ground for both sketch of course and of position.)

- (e) All reports and sketches must be signed by the officer making them.
- (f) All sketches must be done on the course and be prepared on paper ruled in squares to the scale given and show a north point. The authorised table of conventional signs should be adhered to. The use of colored chalk pencils is recommended.

2. The following principles will be observed :—

- (a) The tract of country given each patrol should be 15 miles in length and one mile in breadth over unknown ground and at a distance from cantonments.
- (b) The course should not be laid out in a straight line away from the starting point, but be zigzagged with five changes of direction, each to be marked by a flag-bearer who will be given a paper on which is noted the compass bearing of the centre of the track in which the flagman next to him is posted. These points are previously posted and their position is unknown to the patrol. If con-

sidered necessary the course for native officers may be made easier than for British officers.

The message held by flagmen might be in some such form as follows :—

“ Arrived at No. 1 Flag at o'clock A.M.,
proceeding N.-N.-W.”

The patrol commander takes this message, fills in the time of his arrival, despatches it by a man from his patrol to the “Receiving Point,” noting pace and time of despatch, etc., and then proceeds with his patrol N.-N.-W. in search of the next flagman, learns his further direction from the paper he holds, and so on.

The compass bearing, held by a flagman, should be the bearing from him up to the centre of the tract, and not to the next flagman, who is posted anywhere within the tract. Places should not be named.

Flagmen should not be too conspicuously placed. Though not hidden, they should be posted inside villages, copses, etc., thus ensuring thorough searching by the patrols.

(c) No indications of the part of the country selected or of the position of the enemy or of his strength, etc., must be given to the patrol commanders before starting.

(d) Commanding officers should vary the nature of information which they call for under the column “Reconnaissance of country traversed,” in India Army Form 471, substituting

for the entries in that column, lettered (a), (b), (c) any specific details given in the authorised works of reconnaissance which may be specifically applicable to the country traversed.

- (e) Clear directions should be given as to what to report on ; among any others, the following headings must be given :—
 - (i) Nature of country traversed, whether practicable for all arms, and, if so, at what rate by each.
 - (ii) Obstacles met with and how negotiable.
 - (iii) Description of roads, rivers, railways and nullahs met.
 - (iv) Approximate size of villages or towns passed and their construction.
 - (v) Positions, if any, passed on course.
 - (vi) Extent and nature of position held by enemy and how facing.
 - (vii) Composition of force and easiest way to attack it. Conventional signs for troops to be used and detail to be entered on side of sketch map.
- (f) A correct sketch of course and of position should be furnished, and also of the course with the information under (i), (ii) and (iii), etc., above.
- (g) An enemy's position, one mile in length, will, when formed-bodies of troops are not available, be marked out with flags, discs or

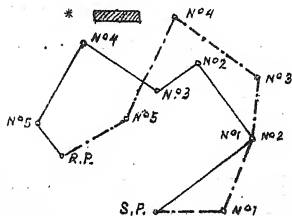
screens, etc., representing all arms near the track. The patrol or its commander must not approach this position closer than half a mile.

- (h) All messages despatched from the patrol are to be sent to the "Receiving Point," a place selected at least three miles distant from the starting point. The patrol commander will be informed of its position before starting, and it is at that place that the patrol completes its course.
 - (i) The pace of the patrols must be an average of 4 miles an hour. The rate of the transmission of intelligence to the "Receiving Point" will be the pace ordered by the despatching officer: this pace to be not under 6 miles per hour.
 - (j) The exercise will be superintended by a Committee or Superintending Officer who will collect the despatches as they arrive at the "Receiving Point," and calculate and note according to the distance carried and the pace ordered, the time that each message should have arrived. The time the patrol takes to complete the course will also be taken.
 - (k) A rough sketch and report, both of the enemy's position reconnoitred and of the whole country traversed, will be submitted.
- The report of the enemy's position and sketch of the same should be sent to the "Receiving

Point " from the place of observation. The report must comprise the nature of the position, how facing, weakest point, number and description of troops in it, and best line of approach for all arms.

- (l) In order that successive patrols might not gain an undue knowledge of the course, the Committee or Superintending Officer should endeavour, if possible, to vary the course for each patrol. Two or more patrols might start at the same time, and, if necessary, cross each other *en route*, the plan below being taken as a general guide

ROUGH DIAGRAM.



S. P. Starting Point.
 R. P. Receiving Point.
 No. 1 Patrol ————
 No. 2 Patrol ————
 * Position of enemy

The courses should be varied in those regiments which are proficient in the exercise, but, when this is done, all the work should be done on the same day, if the patrol courses are in any way adjacent to one another.

3. The reports to be forwarded by Commanding Officers to the Lieutenant-General of the Command, through General Officers Commanding Districts, comprise :—

* *Patrolling duty.*— In all such exercises the first condition is that the ground must be looked at from a certain point of view of military importance: to be of any use the mission must never be of a merely general character. (Instructions for cavalry : Von Schmidt, page 207.)

(a) A copy of the instructions issued by the Officer Commanding the Regiment, with reference to the definite objects * of the ride, besides that of finding the enemy and the flags.

(b) Correct map or maps of the country traversed by each patrol showing position of enemy and flagmen. Where different country is allotted to native officers, this should be stated, and their reports, if in the vernacular, should be translated as well as all vernacular remarks on the maps to admit of the inspecting officer judging of their value.

(c) A separate map of the enemy's position showing the detailed disposition of the force, the proper conventional signs being used. In a corner of this map a detail of the enemy's strength should be written.

(d) A report on India Army Form 472 showing marks allotted ?

(e) A patrol report from each patrol commander on India Army Form 471, which is to be accompanied by—

(i) A sketch of position taken up by the enemy and his strength and disposition.

(ii) Written report on above.

NOTE.—The above may often with advantage be on one piece of paper.

(iii) Sketch of country traversed.

The pieces of paper taken over from flagmen are not to be forwarded if they are merely as given in para. 2 (b).

4. The practice will be decided as follows:—

(a) The correct following of the course, by aid of the compass, at the required rate, as shown by the collection of the messages held by the flagmen, and report of the enemy's position Marks, 60

(One point deducted for every 5 minutes slower than 4 miles an hour, but an extra half hour will be allowed for the sketches to be finished on the course, *vide* paragraph 1 (f). No credit will be given for completing the course at a rate quicker than that named.)

(b) The correct transmission of intelligence, 10 marks for each message Marks, 60.

(One point deducted for every 5 minutes slower than the pace ordered by the despatching officer—*vide* paragraph 2 (i).

(c) Patrol commander's report and sketch of enemy's position reconnoitred .. Marks,	25
(d) Patrol commander's report and sketch of country traversed—	
Marks	$\left\{ \begin{array}{l} \text{for report} \quad 25 \\ \text{for map} \quad 15 \end{array} \right\} 40$
(e) The condition of the horses ..	.. Marks 10
Total	.. Marks, <u>195</u>

5. As the chief object of the practice is to test the improvement made in a regiment during the preceding year in reconnoitring, transmission of intelligence, sketching and reporting of a country traversed, etc., it can of itself be of little use unless officers are constantly practised in these duties. As the native officers of Native Cavalry Regiments need considerable further instruction on this subject, squadron commanders during the squadron training should be instructed to lay out a flag position; native officers in charge of patrols should be given a general bearing on the position from different starting points and be instructed to find out the position of the enemy, and to submit a rough sketch with a report of the strength of the enemy, nature of surrounding country and best way to attack.

These reports and sketches should be inspected by the squadron commander on the spot, and he should point out to each man his mistakes, make suggestions, etc., and give him a clearer idea of what is required of him, On the way home he should explain the different features of the country, what was necessary to report and what not.

All non-commissioned officers should also be employed with these patrols for instruction.

Native officers should be instructed in the simpler conventional signs, such as those representing the different arms.

N.B.—A pamphlet entitled "Course of Reconnaissance for Cavalry soldiers," by Captain J. E. Nixon, will be found most useful. This work is procurable from the *Civil and Military News Press*, Ludhiana, at Re.1 per copy.

INDIA ARMY FORM 471.
Supplied gratis.

REGIMENT. SQUADRON. PATROL.

Chart and Compass Practice, 189 . Station Date

Report of Intelligence transmitted and country traversed.

1							2*					
Points in order of merit.	Rank and name of Commander.	STRENGTH.		Time of start.	Length of course.	Actual time taken.	TRANSMISSION OF INTELLIGENCE.					
		Non-Commissioned Officers.	Men.				No. 1 Flag.	No. 2 Flag.	No. 3 Flag.	Enemy's position.	No. 4 Flag.	No. 5 Flag.
							Hr. Mt.	Hr. Mt.	Hr. Mt.	Hr. Mt.	Hr. Mt.	Hr. Mt.
3							4					
RECONNAISSANCE OF COUNTRY TRAVERSED. †							REMARKS.					
<p>(a) General features, whether passable for all arms, and if so, at what rate.</p> <p>(b) Communication and nature of all roads, their width and material; also railways.</p> <p>(c) Obstacles such as rivers, nullahs, or canals, etc., special notice being given to their passages.</p>												
Continue overleaf if necessary.												

* In column 2 the exact time of despatch of each message must be entered.

† The report on the enemy's position must comprise (a) its nature, (b) how facing, (c) weakest points, (d) number and distribution of troops in it, (e) best line of approach for all arms, and, together with the sketch of the position, should be sent into the receiving point by a messenger as early as possible.

To The Superintending Officer Commanding No. Patrol. Rank. Squadron.

Report on Chart and Compass Practice held by the

at

on the

(a)

(b)

(c) (d)

(e)

REPORTS AND
SKETCHES.

TRANSMISSION OF INTELLIGENCE.

STRENGTH.

Non-Commissioned
Officers.

Men.

Time of start.

Length of course.

Correct time to complete
course.

Actual time taken.

Points deducted.

Total points.

No. 1 FLAG.

No. 2 FLAG.

No. 3 FLAG.

ENEMY'S
POSITION.

No. 4 FLAG.

No. 5 FLAG.

Total points.

Enemy's position
recomitred.

Country traversed.

Condition of horses.

Grand Total points.

REMARKS.

Name and rank of
Commander.

Time.

Deduct.

Points.

Time.

Deduct.

Points.

Time.

Deduct.

Points.

Time.

Deduct.

Points.

Time.

Deduct.

Points.

Time.

Deduct.

Points.

NOTE.—In column (b) the exact time taken for each message to reach the receiving point must be entered.

To

The Assistant Adjutant General,

District.

Superintending Officer.

SECTION XXVIII.

TACTICAL PROBLEMS.

THE following problems will be found useful for testing the capabilities of commanders in the field, more especially in coming to a rapid decision and maintaining control over their men. They have been practically solved and the remarks of inspecting officers are given for guidance in italics.

For a Squadron.

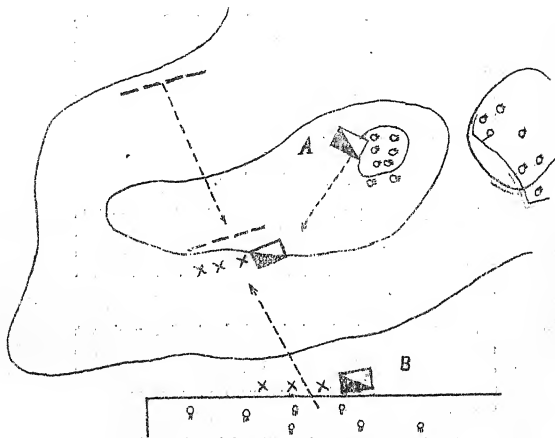
Flags are used to indicate additional troops while there is always on each side one complete squadron; white flags indicate Cavalry, red and white Infantry, and red and blue Artillery.

(1) Squadron leader A, in left front of a regiment to cover its advance from that quarter, has reached the clump of trees shown on sketch, and is ordered to make a flank attack at the right moment, squadron A is the one being inspected.

A hostile squadron B is on the right of a regiment in line. The regiment is marked by flags and has to

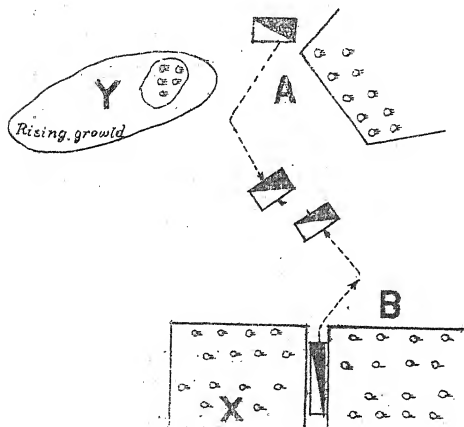
advance against another flagged regiment (*see sketch*). The commander of B squadron was ordered not to leave this regiment, but to attack the enemy straight in his front as he was supported on his right rear.

No. 1.



(2) Squadron B in sections, in the road, in wood. A is ordered to advance as shown on sketch No. 2; B has to deploy as rapidly as possible and attack.

No. 2.



(3) A squadron holding wood X (see sketch No. 2) with dismounted fire against a party of infantry on rising ground, Y is ordered to mount and charge the infantry. The cavalry from the wood advances in extended order, but while it advances a hostile squadron is brought down upon its flank from the left front.

The only thing for the extended squadron to do, is to rally as rapidly as possible behind its leaders and move direct upon the enemy.

(4) A squadron advances as flank offensive on the right front of a flagged regiment.

A hostile regiment, consisting of three flagged squadrons and one complete squadron, is sent against it.

This is to test the leading squadron acting as flank offensive. The attack was pronounced successful and he was ordered to pursue.

(5) An attack is made by cavalry on artillery, the latter is indicated by flags.

This first line of the cavalry also consists of flags. One of the squadrons in the second line is the one which is being inspected, and during the advance on the guns, the escort to the guns is brought suddenly upon its flank.

(6) A squadron in sections in wood ordered to advance and attack guns in position which are supported by cavalry.

If there is cavalry with guns, then the object should be to get to close quarters with the hostile cavalry at once, for then the guns cannot fire on the attacking cavalry.

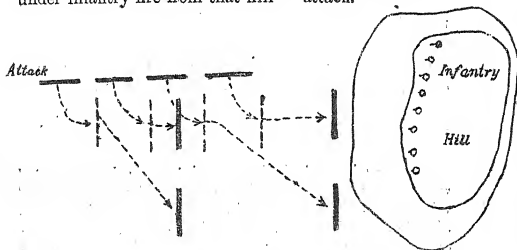
(7) A squadron leader is shown a force moving on a road. He is told that it is retreating after a fight. His squadron belongs to a body of reconnoitring cavalry which is following in pursuit.

He has to make up his mind at once what to do. Of course, he decides to attack at once, and a hostile squadron comes against his flank during the advance.

For a Regiment.

(1) A regiment had formed line in a certain direction, and was advancing at the gallop.

The General said to the regimental commander, pointing to a rising ground to the left front, "You are under infantry fire from that hill—'attack.'"



The commander at once wheeled all the squadrons to the left by trumpet sound, sent his second-in-command to the second squadron with orders to form line

on the right of the leading squadron and to attack the infantry. While he himself told the fourth squadron to act in a similar manner on the right of the third squadron.

The second-in-command led the first line, the commander of the regiment the second line.

When manœuvring, the commander of a regiment was always accompanied by his second-in-command, the regimental adjutant, and two trumpeters. The advantage of having these officers with him is seen in the above instance.

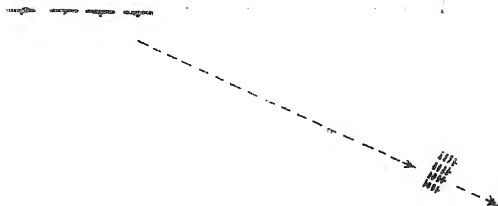
(2) - Another problem dealing with the sudden attack upon infantry was as follows:—

The regiment had charged and was broken up in the *mêlée*. The General ordered the commander to attack a body of infantry which he supposed to be about some bushes about 1,000 yards to the right front.

The way he wished this attack to have been executed was simply to sound "rally," followed by the "charge," when each squadron would rally and attack in succession to the half front. There is no time, on such an occasion, for rallying the whole regiment; but an attack must be made without a moment's delay.

(3) A regiment had attacked, and was broken up in the *mêlée*; the General ordered the commander to

form his regiment in mass without delay, facing as shown in the sketch, ready for eventualities.



What was required was, first: order the direction; secondly, sound regimental call.

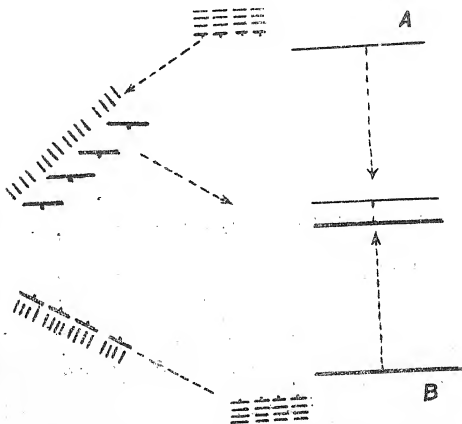
(4) A whole regiment was formed in column of sections on a road passing through a wood; the order was given to form line and attack.

Troops, of course, were formed, and then squadrons, so that each squadron was in position to attack in a sort of echelon if need be.

For a Division.

(1) The first lines of two opposing cavalry divisions were indicated with flags, and led by two officers directly against each other. About 3,000 to 4,000 yards separated these lines.

The two cavalry régiments which were being inspected, were echeloned in mass on the right and left, respectively, of their own first lines, and were ordered to support the attack of their first lines.



A moved off as shown in sketch, and B acted as also shown.

The gist of the remarks were that—

- (a) *The first duty of the second line is to ensure the success of the first line, and to prevent the enemy's second line from outflanking it. B ignored this part of his duty.*
- (b) *Given that A had moved off as shown, B would have done better to have formed squadron columns, and gone heads half left. If the enemy allows him to gain ground to a flank well and good, and he (B) has only to form line to his original front and attack. The worst that can happen is that the attack is frontal.*

Suppose the enemy tries to counteract this move, B has again only to form to front and attack.

Several exercises of a similar nature with one of the lines of a division marked with flags can be given.

(2) One regiment was brought up along a road through a wood and ordered to advance and attack a hostile cavalry regiment stationed at a suitable distance from the exit.

The necessity for at first keeping a reserve of—say, a couple of squadrons to meet eventualities was insisted upon.

The manner in which the deployment was executed was commented on: three squadrons formed a first line and two a second line at some distance on the left by passing through the wood. The enemy, however, came rather from the right front

A similar sort of exercise can be practised over a bridge.

(3) Infantry were shown to be retreating after a fight towards a wood; a regiment of cavalry supported the infantry on its left at about 1,000 yards distance, but hid from view of the enemy. The commander of the hostile cavalry was told to act as he thought best. He attacked, and the retreating cavalry moved out to support the infantry.

Similar exercises with cavalry acting in support of opposing advanced and rear-guards can be given. For such studies to be of real profit, it is necessary to know the ground, as the problem was in each case made as like reality as possible.

SECTION XXIX.

ANNUAL LONG RECONNAISSANCE.

A "long reconnaissance" will be carried out annually by all British and Native cavalry regiments, for a period of one week, with a "general idea" in accordance with the Cavalry Drill. Some portion of the regiment should invariably be detached as an enemy, which can be supplemented by flagmen, if necessary.

The work should be carried out, as far as possible, under service conditions (including scale of baggage, etc., in accordance with Field Service Equipment Tables).

If more than one regiment is in the station, endeavours should be made to combine in carrying out the above. In the case of adjacent cavalry stations, in the same or different districts, it is desirable that the week's reconnaissance should be that of opposing forces, from the respective stations.

Regiments may execute the "long reconnaissance" at any time during the drill season, provided general officers commanding consider they have had sufficient preliminary instruction in reconnaissance work.

Sketches with detailed reports of the operations should be submitted to the District Staff Office for the inspection of the General Officer Commanding, who will cause them to be carefully examined, and any defects brought to the notice of Commanding Officers. Those of the regiments most deserving of merit in each district should be submitted to the Inspector-General of Cavalry in India by the 1st May.

The following documents should accompany the reports submitted to the Inspector-General of Cavalry in India :—

- (1) General idea.
- (2) Special orders issued to the brigade or regiment.
- (3) Correct map of the country reconnoitred, showing in coloured pencil the route of each squadron, and generally the enemy's position.

(4) Diary of the reports on the following form :—

No. of message.	Place and square from which despatched.	Who from.	Time sent.	Time received.	Purport of message.
1	Dogri (L-5).	O. C. R. A. S.	1-5 P.M.	1-47 P.M.	Two troops of enemy moving west through Nagar (L-6) at a trot.

(5) Report by Commanding Officer on the work done.

NOTE.—*Vide* G.O.C.C. 428 of 1898.

SECTION XXX.**THE LOSS OF HORSES IN WAR.***

THE following most interesting and instructive article on the above subject was contributed by Veterinary-Captain F. Smith F.R.C.V.S., Army Veterinary Department to the Royal United Service Journal :—

We hear very little about the loss of horses in war, and yet, as I shall have to show, it is a serious military and financial consideration.

The losses in campaigning may be divided into two classes : preventable and non-preventable ; as classes, these are perfectly distinct, though here and there they overlap in such a way as to be nearly indistinguishable.

The preventable losses amongst the horses of an army in the field are starvation, sore-backs, stampedes, board-a-ship injuries, and certain diseases which arise from bad management. The non-preventable are losses arising from indifferent or imperfectly prepared food, losses accelerated by weather, *viz.*, heat, cold and rain : losses caused by the fire of the enemy ; by exhaustion following on prolonged military operations and retreats, and those caused by disease.

The object of this paper is to deal with those causes of loss which have not been fully brought home to us. I allude to losses under fire, losses during retreats, from starvation, defective shoeing, sore-backs, exhaustion, transport by sea, and stampedes. We shall then briefly

* A brief summary of this paper appeared in the " United Service Magazine," August, 1893.

review the entire causes of loss to an army in the field, and endeavour to ascertain what we must be prepared to meet in the future.

The literature of my subject is very scattered, and often scanty; the losses under fire are generally given in the official despatches; but all other sources of loss are rarely alluded to. Take the important question of sore-backs: only one paper, so far as I am aware, has been published on the subject of the inefficiency and loss occasioned by these during war;* and it is only since 1879 that we have had any exact knowledge of the numbers which have occurred in our campaigns. Even the Germans, in spite of their methodical habits and complete official information, make no mention, either in the 1886 or 1870-71 campaigns of the losses which they sustained from sore-backs alone. Of the other causes of loss, two papers have been published on the losses of horses under fire in the campaign of 1870-71; they are based on the official German returns: one on the loss of artillery horses was published in the "*Revue Militaire de l'Étranger*," 1872, † and the other on the loss of cavalry horses appeared in the "*Revue de Cavalerie*," 1887. Finally, in this journal was published a lecture on "*Casualties in the Field amongst Horses*," dealing more particularly with our recent campaigns. ‡ With these exceptions, I know of no other papers dealing with the loss of horses in war.

* "Sore Backs among Army Horses," I.V.S. (now V.-Colonel) James Lambert, A.V.D., "*Veterinary Journal*," March, 1881.

† Translated by Major (now Colonel) Hime, in the "*Proceedings of the Royal Artillery Institution*," 1874.

‡ "The Casualties among Army Horses in the Field," I.V.S. (now V.-Lieut.-Colonel) W. B. Walters, A.V.D.

The information I have collected of losses under fire is very largely supplied from the regimental records of our cavalry. The student of history cannot help but regret that the majority of these regiments have lost half a century of their history through these records not being kept up to date.

My other sources of information are acknowledged elsewhere; though these references give no idea of the immense amount of material which has had to be worked through to obtain even the incomplete information which I purpose detailing.

LOSSES OF HORSES IN ACTION.

Apart from the importance attached to knowing what the probable losses of cavalry and artillery horses will be in action, it is interesting to note the relative frequency with which men and horses are hit. I shall have to show that the number of horses killed and wounded, as a rule, exceeds that of the men; this is especially the case with artillery; but the difference in numbers is less in cavalry, though there are many noteworthy exceptions.

A horse offers a much larger target than a man, and he presents this large surface at some little height above the ground. Observations on men show how much more frequent injuries of the upper half of the body are, compared with those of the lower half: in this respect the horse decidedly labours under a disadvantage, for his large surface corresponds in height with the upper half of man, and a larger proportion of hits

are consequently received. I shall have to show in dealing with artillery horses, especially those of the Franco-German war, that the large target represented by the horses of a battery produces, in some cases, an enormous increase in the injuries inflicted on the quadruped as compared with the biped. The same thing, though not so marked, holds good for cavalry, excepting when exposed to a severe and concentrated fire as in a charge, or in the injuries resulting from hand-to-hand fighting; here, as we might suppose, the number of casualties amongst men and horses more closely approaches each other.

The earliest records of losses that I have met with are those at the battle of Aghrim in Ireland in 1691; the records are of two regiments only, but are interesting as giving us some notion that short-range artillery and protective body armour did not render fighting in those days anything but a serious business. These two regiments charged the rebels, and it is probable that in this way the majority of the losses occurred:—

Battle of Aghrim.

Men.			Horses.		
Killed.	Wounded.	Missing.	Killed.	Wounded.	Missing.
72	26	0	35	24	0
Total—98.			Total—59.		

Battle of Talavera.

A singular accident happened to the cavalry at this battle through the ground not being reconnoitred over which they were to charge, and by which the 23rd

Light Dragoons were precipitated into a ravine. It is strange how history repeats itself. An identical accident, and from the same cause, occurred to a regiment of Prussian cavalry at the Battle of Koeniggraetz in 1866.

Brigaded with the 23rd Light Dragoons at Talavera was the 1st Regiment of Hussars, King's German Legion; the two regiments were ordered to charge the French infantry. Just as the charge commenced, the brigade came on the ravine; the foremost horseman rode headlong into it, and a frightful scene ensued. The hussars suffered less than the dragoons. The charge was useless; and, to add to the disorder, the French artillery swept their ranks. Here are the losses of the brigade:—

Men.			Horses.		
Killed.	Wounded.	Missing.	Killed.	Wounded.	Missing.
50	84	110	102	52	134
Total—244.			Total—288.		

The remaining cavalry losses at the same battle were:—

Men.			Horses.		
Killed.	Wounded.	Missing.	Killed.	Wounded.	Missing.
12	29	2	53	13	23
Total—43.			Total—89.		

The increase in the loss of horses is doubtless due to artillery fire.

We are also able to give the artillery losses at Talavera; this for the men was 66, and for the horses 40. This great difference between men and horses in artillery is quite exceptional in later battles.

BATTLE OF ALBUERA.

Artillery Losses.

Men.			Horses.		
Killed.	Wounded.	Missing.	Killed.	Wounded.	Missing.
3	28	41	33	10	34
Total—72.			Total—77.		

The small difference in the losses is here accounted for by the large number of missing. There were only 31 men killed and wounded against 43 horses.

Cavalry Losses.

Men.			Horses.		
Killed.	Wounded.	Missing.	Killed.	Wounded.	Missing.
13	30	5	21	16	6
Total—48.			Total—43.		

The heaviest loss was in the present 4th Hussars in hand-to-hand fighting with the Polish lancers.

BATTLE OF WATERLOO.

Very complete returns are obtainable for this battle, not only for the British troops, but also for the allies.*

British Artillery.

Men.			Horses.		
Killed.	Wounded.	Missing.	Killed.	Wounded.	Missing.
57	235	10	337	123	35

Artillery, King's German Legion.

20	57	4	51	0	0
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* "History of the Waterloo Campaign."—SIBORNE.

Dutch-Belgian Artillery.

Men.			Horses.		
Killed.	Wounded.	Missing.	Killed.	Wounded.	Missing.
28	116	30	175	6	15

Prussian Artillery.

15	66	9	58	44	0
120	474	53	621	173	40
Total—647.			Total—834.		

This battle demonstrates the great excess of loss amongst the horses, especially that of the British. G. Troop, British artillery, suffered the heaviest loss, both in horses and men; and Mercer (the commanding officer of the troop) has placed on record, in his interesting "Journal of the Waterloo Campaign," the disastrous effect of the French fire on his battery. Of 200 horses which went into action, 140 were killed or wounded.

Mercer was not wounded, though his horse was hit in eight places. Marshal Ney had five horses killed under him, but he escaped unhurt.

Mercer records that one-third of his men were killed; his account of the desolation produced in a battery under heavy fire for hours is terrible. His description of the behaviour of the mortally wounded horses is strikingly real, showing his great power of observation.

CAVALRY LOSSES, WATERLOO.

British Cavalry.

Men.			Horses		
Killed.	Wounded.	Missing.	Killed.	Wounded.	Missing.
567	1,046	409	982	596	673

Cavalry, King's German Legion.

Men.			Horses.		
Killed.	Wounded.	Missing.	Killed.	Wounded.	Missing.
98	258	12	194	144	54
<i>Dutch-Belgian Cavalry.</i>					
163	614	452	549	0 *	884
<i>Prussian Cavalry.</i>					
40	327	94	248	324	90
868	2,245	967	1,973	1,064	1,701
Total—4,080.			Total—4,738.		

This cavalry loss is equal to 32·5 per cent. of the men killed, wounded, or missing, and of the horses 38 per cent.

In no other battle, until we come to Vionville-Mars-la-Tour, have we such an opportunity for studying the effect of severe hand-to-hand fighting, and fighting at close quarters with infantry, as at Waterloo. The regimental losses are, therefore, most instructive.

The celebrated charges of the Heavy Brigade and Union Brigade were only accomplished by very heavy losses; the former was directed against the French cuirassiers, the latter against the French infantry, ultimately both brigades against the artillery; and, lastly, they had to defend themselves in an exhausted condition against a body of cavalry.

Loss of the Heavy Brigade.

Men.			Horses.		
Killed.	Wounded.	Missing.	Killed.	Wounded.	Missing.
95	248	250	248	69	355
Total—594.			Total—672.		

* No wounded horses shown in the return.

Loss of the Union Brigade.

Men.			Horses.		
Killed.	Wounded.	Missing.	Killed.	Wounded.	Missing.
264	310	38	445	131	55
Total—612.			Total—631.		

The Greys lost the largest number of men killed, 102, and the largest number of horses, 179. The Inniskillings had the largest number of men and horses wounded, *viz.*, 116 and 49, respectively; whilst the King's Dragoon Guards had the largest number of men and horses missing, *viz.*, 128 and 243.

The result of these charges was the destruction of 5,000 infantry, 3,000 prisoners taken, and 40 guns rendered useless.

The loss of the brigade was as follows:—

	Men.	Horses.
Heavy Brigade	.. 48·36 per cent.	54·8 per cent.
Union "	.. 51·8 "	53·4 "

Napoleon's Losses.

Napoleon's losses amongst horses under fire I have not been able to trace; it is said that at Marengo Kellermann's brigade was 470 horses strong before the battle, and only 150 horses remained at the end of the day. In a life of Kellermann, published in the "*Revue de Cavalerie*,"* it is stated that at Marengo the heavy cavalry was reduced from 800 horses to less than 300.

At Eylau the losses on both sides were terrific owing, as Alison says, "to the extraordinary quantity of cannon balls discharged at close proximity to the contending masses." This authority† says that 6,000 horses

* March, 1887. † "*History of Europe*," Vol. II.

were killed or wounded, and his description of the winter battle-field is very painful.

At Fuentes d'Onor Massena * put the French loss of horses killed at 246 for the cavalry of Montbrun, and 20 for the artillery. The strength of the cavalry before the battle was 2,150 horses; no mention is made of the number wounded.

It is possible, however, to get at Napoleon's losses indirectly. General Bourcier had charge of the remounting of the Grande Armée at Potsdam, and in a letter to the Emperor, dated 1806, he said that the number of wounded horses at Potsdam was astounding—2,347 out of a total of 3,807; and a return furnished of the small regimental dépôts stationed at the same place shows, that out of 742 horses, no less than 429 were sick and wounded.†

There is no mention of the cause of the wounds, but I take it that they refer to those received in action, and wounds from the saddle.

Battles in India.

Turning now to some of the battles in India, we find that the united losses at Mehidpoor, Leswarree, Ferruckabad, and Siege of Blurtpoor, amounted for the cavalry to—

Men.			Horses.		
Killed.	Wounded.	Missing.	Killed.	Wounded.	Missing.
31	92	0	118	63	53
Total—123.			Total—234.		

* Koch's "Mémoires de Masséna."

† "Revue de Cavalerie," 1893.

The artillery losses at Mehidpoor were 20 men and 45 horses.

The losses in the Afghan campaign of 1839 were heavy; but this was not due to the enemy, and the figures will be quoted later.

In the Sikh campaigns of 1845-46 the losses were very heavy.

BATTLE OF MOODKEE.

<i>Artillery.</i>					
Men.			Horses.		
Killed.	Wounded.	Missing.	Killed.	Wounded.	Missing.
27	49	0	45	25	0
Total—76.			Total—70.		
<i>Cavalry.</i>					
91	87	0	165	63	0
Total—178.			Total—228.		

In this battle fewer artillery horses were killed than men, which is very exceptional. The cavalry loss was heavy, and principally occurred to the present 3rd Hussars, who with a strength of 518 charged a force said to consist of 30,000 infantry and cavalry. The enemy was put to flight and pursued. The loss of the 3rd Hussars was 60 men and 105 horses killed, 37 men and 23 horses wounded.

BATTLE OF FEROZESHAH.

<i>Artillery.</i>					
Men.			Horses.		
Killed.	Wounded.	Missing.	Killed.	Wounded.	Missing.
41	69	0	118	79	0
Total—110.			Total—197.		

Cavalry.

Men.			Horses.		
Killed.	Wounded.	Missing.	Killed.	Wounded.	Missing.
83	142	0	271	114	0
Total—225.			Total—385.		

The loss of horses is here greater both in artillery and cavalry. The brunt of the action again fell on the 3rd Hussars, who charged the Sikh guns in magnificent style, and rode through the enemy's camp. The loss of the regiment was 55 men and 107 horses killed, 93 men and 60 horses wounded.

BATTLE OF ALIWAL.

Artillery.

Men.			Horses.		
Killed.	Wounded.	Missing.	Killed.	Wounded.	Missing.
3	15	5	30	9	12
Total—23.			Total—51.		

Cavalry.

96	146	0	145	70	85
Total—242.			Total—300.		

The loss of horses is greater than men in both artillery and cavalry: 23 men and 51 horses in the artillery; 242 men and 300 horses in the cavalry. The chief loss occurred to the 16th Lancers. This regiment charged the Sikh artillery; desperate hand-to-hand fighting occurred with the infantry, which was broken and driven into the Sutlej. The 16th Lancers had 58 men and 77 horses killed, 83 men and 22 horses wounded, 1 man and 73 horses missing.

BATTLE OF SOBRAON.

<i>Artillery.</i>					
Men.			Horses.		
Killed.	Wounded.	Missing.	Killed.	Wounded.	Missing.
7	45	0	17	23	5
Total—52.			Total—45.		
<i>Cavalry.</i>					
6	38	0	13	50	24
Total—44.			Total—87.		

Operations around Delhi from 30th May to 20th
September, 1857.

<i>Artillery.</i>					
Men.			Horses.		
Killed.	Wounded.	Missing.	Killed.	Wounded.	Missing.
74	289	4	54	62	4
Total—367.			Total—120.		
<i>Cavalry.</i>					
46	77	0	55	57	36
Total—123.			Total—148.		

The excess of men killed and wounded over horses in the artillery is explained by the siege.

CRIMEAN CAMPAIGN.

The loss of horses in this campaign was very severe; not, however, at the hands of the enemy, but from other causes which have yet to be dealt with.

The loss of horses killed in action, excepting at Balaclava, was insignificant.

BATTLE OF THE ALMA.

Artillery Losses.

Men.		Horses.	
Killed.	Wounded.	Killed.	Wounded.
12	21	26	0
Total—33.		Total—26.	

BATTLE OF BALACLAVA.

Heavy Cavalry Losses.

Men.		Horses.	
Killed.	Wounded.	Killed.	Wounded.
9	97	46	68.
Total—106.		Total—114.	

A great discrepancy occurs in various works dealing with this battle, as to both the heavy and light cavalry losses. The losses of men I have taken from the official returns, the loss of horses from the evidence given by Lord Lucan before the Chelsea Commissioners. It must be remarked that the above losses do not represent those which occurred in the charge; all eye-witnesses are unanimous that our losses were trifling. Kinglake says, 78 men killed and wounded. Russell says, 35 killed and wounded, of which 4 or 5 were killed outright. Calthorpe puts the casualties at barely 20. The Russian losses are variously stated from 200 to 500, but it is certain that the chief loss they suffered was not received at the hands of our cavalry, but from C. Troop, R.H.A., which fired, according to Whynatees 49 shot and shell after them in their retreat, at a comparatively short range, and made "splendid practice."*

* "From Corunna to Sebastopol."

The trifling losses of the Heavy Brigade in the charge were considerably augmented by the artillery fire to which they were exposed in covering the retreat of the light cavalry, and there can be no doubt that most of the killed and wounded in the above table are thus accounted for.

Light Cavalry Losses.

It is equally difficult to obtain accurate figures for the light cavalry losses. I have selected those obtained from official returns published at the time, from information supplied by the regiments concerned. These are also quoted by Whynates, who, after careful investigation, considers them reliable.

On the morning of Balaclava the Light Brigade had on parade 658 horses, including officers. They lost in the charge—

Men—277.

Horses—362.

or, on the total strength, a loss of men equivalent to 40·57 per cent., and of horses, 50 per cent. This is not quite so severe as the loss of the Heavy Brigade at Waterloo. Lord Lucan put the loss of horses at 300; Kinglake put it at 475, including 43 shot for wounds, and 42 others wounded. Russell put it as 394 killed and 126 wounded. The number quoted above is from the regimental records, and should be correct.

French Cavalry Losses.

In the gallant charge made by 200 French Chasseurs d'Afrique at Balacava, they lost—

Men.		Horses.	
Killed.	Wounded.	Killed.	Wounded.
13	7	16	12
Total—20.		Total—28.	

Artillery Losses.

The artillery lost in the battles of the Alma, Balacava and Inkerman, 96 horses killed in action or died from wounds.

AMERICAN CIVIL WAR.

The literature of this war is enormous, and it has been difficult, from the seventy odd official volumes published up to date, to obtain any connected account of the loss of horses. I have therefore only selected one or two cases where the losses are clearly tabulated.

BATTLE OF GETTYSBURG.

Artillery Losses of the 3rd Corps.

Men.			Horses.		
Killed.	Wounded.	Missing.	Killed.	Captured.	Missing.
17	111	29	190	50	187
Total—157.			Total—427.		

Cavalry (Fitz Lee's Brigade).

3	33	27	15	Wounded. 14	0
Total—63			Total—29.		

Artillery, Army of the Potomac.

Total loss—737.

Total loss—881.

Cavalry (6th Virginia Regiment).

Total loss—298.

Total loss—292.

Battle of Fleetwood.

In the fight at Kelly's Ford, General Lee reports the following loss amongst Stuart's cavalry :—

Men.			Horses.		
Killed.	Wounded.	Missing.	Killed.	Wounded.	Missing.
11	88	34	71	87	12
Total—133.			Total—170.		

Expedition to Tupelo, Miss.

Three cavalry regiments marched 350 miles ; there was but little forage or water, which probably accounts for the missing—

Men.			Horses.		
Killed.	Wounded.	Missing.	Killed.	Wounded.	Missing.
2	32	3	19	32	40
Total—37.			Total—91.		

AUSTRIAN WAR, 1866.

I have only been able to obtain returns from one battle, and these unfortunately give only the total losses, and no details.

BATTLE OF KOENIGGRAETZ.

Prussian Artillery Losses.

Men—314.

Horses—307.

In this battle we meet with an important exception to the rule that more artillery horses are killed than men, and it is difficult to see the reason why this should have been the case at Koeniggratz. An Austrian battery captured by the Prussians lost 54 men and 58 horses; a second captured battery lost 27 men and 41 horses in one position.

The cavalry losses are interesting, though very incomplete. At the termination of the battle and during the pursuit there were some sharp cavalry encounters.

Prussian Cavalry Losses.

Men—615.

Horses—536.

The Prussians lost more men than horses, which is very exceptional.

Austrian Cavalry Losses.

These were fearfully heavy, illustrating the deadly effect of breech-loading rifles. The Austrian losses are given in detail:—

Men.			Horses.		
Killed.	Wounded.	Missing.	Killed.	Wounded.	Missing.
317	348	314	1,055	235	850
Total—979.			Total—2,140.		

These severe losses were doubtless intensified by the subsequent retreat of the army. It is important to note that there were more than two horses lost for every man.

I have previously alluded to the incident of one Prussian regiment charging into a ravine, as at Talavera. Unfortunately the losses at the ravine are not clearly given, the table showing a regimental loss of 201 men and 87 horses, but the number of casualties which occurred at the ravine and in the subsequent charges are not separated.

Associated with the above regiment in the most important cavalry encounter of the day, were two Prussian light regiments. They were attacked by two Austrian Cuirassier regiments; the Prussians lost 86 men and 99 horses; the two regiments of Cuirassiers lost 317 men, but the loss of horses is not stated.

Hozier has made us familiar with the cavalry encounters which took place during the retreat, when the heavy Prussians always rode down the light Austrians.

At Vorkloster both parties met on a bridge, and eventually the Austrians were driven back, after a stubborn resistance.

The Austrians lost 54 men, and 30 horses killed, wounded, and prisoners. The Prussians lost 2 men killed, 18 men wounded, and 3 horses missing. The value of this table is destroyed, so far as the Austrians are concerned, by including the prisoners with the killed and wounded.

The Saxon and Prussian cavalry came into collision during the retreat, and there was severe hand-to-hand fighting. The Prussians lost 2 men killed, 20 wounded, 25 horses disabled. The Saxons lost 19 men and 13 horses killed and wounded.

FRANCO-GERMAN WAR, 1870.

The whole of the following losses refer to the German Army. There appear to have been no losses published by the French.

BATTLE OF WISSENBURG.

Cavalry.

Men.			Horses.		
Killed.	Wounded.	Missing.	Killed.	Wounded.	Missing.
3	7	3	12	5	13
Total—13.			Total—30.		

Artillery.

1	18	3	10	28	8
Total—22.			Total—46.		

BATTLE OF WÖRTH.

Cavalry.

Men.			Horses.		
Killed.	Wounded.	Missing.	Killed.	Wounded.	Missing.
14	44	2	35	16	0
Total—60.			Total—51.		

Artillery.

13	123	1	107	118	0
Total—137.			Total—225.		

Of the cavalry losses in this battle some are very peculiar. The 14th Hussars lost 12 men killed and 18 wounded, but no horses suffered. The 13th Hussars lost 2 men and 20 horses killed, whilst 16 men and 15 horses were wounded.

It was at the battle of Wörth that Michel's Brigade consisting of two cuirassiers and one lancer regiment, charged the Prussian infantry over unreconnoitred ground through hop-fields, and eventually passed into the village of Morsbroun. They were received with volley-firing, and two-thirds of the leading regiment were hit and down before the village was reached; the other regiments got into the streets of Morsbroun, which were found to be barricaded. There was the most dreadful confusion; a heavy fire was poured on them from the houses, and all who were not killed were taken prisoners. The exact losses unfortunately are not given. The regimental history of the 1st Cuirassiers says, that they lost 60 men, but this must be an under-estimate.

Later in the day of the same battle Bonnemain's division charged the Prussian infantry. The charge was made by the 2nd Cuirassiers and one wing of the 3rd Cuirassiers. The ground was again unfavourable, and the regiments were decimated. These are the losses :—

2nd Cuirassiers	...	...	134 men, 250 horses.
3rd	"	...	77 " 70 "

Of the 2nd Cuirassiers 80 horses left on the field returned, but they were so badly wounded that they soon died; they are included in the above loss.

The loss of men in the 2nd Cuirassiers was 30 per cent., and of the horses 57 per cent.

The loss of men in the 3rd Cuirassiers was 32 per cent., and of the horses 35 per cent.

These percentages can only be approximate, as the exact numbers in the charge are not stated.

BATTLE OF SPICHEREN.

<i>Cavalry.</i>					
Men.			Horses.		
Killed.	Wounded.	Missing.	Killed.	Wounded.	Missing.
6	38	1	23	51	2
Total—45.			Total—76.		
<i>Artillery.</i>					
7	73	0	38	65	0
Total—80.			Total—103.		

BATTLE OF COLOMBEY-NOUILLY.

<i>Cavalry.</i>					
Men.			Horses.		
Killed.	Wounded.	Missing.	Killed.	Wounded.	Missing.
5	20	0	14	27	0
Total—25.			Total—41.		
<i>Artillery.</i>					
23	94	1	72	79	0
Total—118.			Total—151.		

In this battle a battery of Prussian artillery came into action 900 yards. from a semicircle of sharpshooters supported by mitrailleuses and a battery firing shrapnel. The Prussians could only fire 28 rounds; the battery was totally shattered and had to retire. As an example of the loss inflicted on them, it is mentioned that a gun without a limber was dragged away by *one* horse. The battery lost 15 men and 20 horses killed; 30 men and 34 horses wounded.

BATTLE OF VINOVILLE—MARS-LA-TOUR.

Men.			<i>Cavalry.</i>			Horses.		
Killed.	Wounded.	Missing.	Killed.	Wounded.	Missing.	Killed.	Wounded.	Missing.
296	977	125	931	298	382			
Total—1,398.						Total—1,611.		
			<i>Artillery.</i>					
172	555	1	688	324	3			
Total—728.						Total—1,015.		

Of all the battles in this campaign this is the one which interests us the most for the heroic charges made by the cavalry resulting in the fearful loss we have given above. Nor were the devoted French cavalry a whit behind their enemy in courage and determination, the only difference between the two being that the French cavalry were uselessly sacrificed, whilst the annihilation of the German regiments was productive of most important results to their army.

FRENCH CAVALRY CHARGE.

The Cuirassiers of the Guard—a total of 5 squadrons—charged two companies of the 52nd Prussian infantry, which did not fire until the enemy was within 250 paces. The cavalry parted to the right and left, and rushed into more infantry behind. According to Bonie,* the cavalry was thrown into disorder by an unforeseen obstacle, consisting of a baggage wagon and biscuit barrels. The steady fire of the Prussians annihilated the force. The French losses were 230 men and 243 horses, or taking the strength at 330, a

* Achievements of Cavalry, "United Service Magazine."

loss of 69·7 per cent. for the men and 73·6 per cent. for the horses. Such losses deserve to be spoken of as extermination.

PRUSSIAN CAVALRY CHARGES.

Charge of the Brigade of Bredow.

Bredow's Brigade consisted of 6 squadrons, in all under 800 strong, composed of the 7th Cuirassiers and 16th Lancers. The object of the charge was to save time, for the Prussians were severely pressed and had no reserves. The brigade first charged the French batteries, then two divisions of infantry, riding over each; they were then attacked by the French cavalry and afterwards retired. It has been stated that during the advance over 1,500 yards until the first infantry line was penetrated, not more than 50 horses fell. The number of infantry brought to bear on these devoted regiments was not less than 8,000. The actual length of the charge was 3,000 yards. These are the losses :—

7th Cuirassiers	...	196 men, 209 horses.
16th Lancers	...	183 „ 200 „
		<hr/>
		379 409

or a loss of 47 per cent. of the men and 51 per cent. of the horses.

The effect of the charge was to stop the advance of the 6th French Corps, and the pressure was removed from the 6th Prussian Infantry Division.

Charge of the Prussian Dragoons of the Guard.

This charge was made against infantry to save von Wedell's infantry brigade, which was being annihilated. Three squadrons took part, having a strength of 426 sabres. They fell upon the 13th French Regiment of the line and cut them up. The three squadrons lost 138 men and 216 horses, or a loss of 32·4 per cent. of the men and 50·7 per cent. of the horses.

The official account of the battle gives the loss as 132 men and 250 horses. Lieutenant-General Sir Evelyn Wood,* who has consulted the latest sources of information, gives the loss as 138 men and 216 horses; whilst the losses for the regiment for the whole day in the German official return are only put at 96 men and 204 horses. I cannot account for these discrepancies.

Grand Mêlée of Cavalry.

Immediately after the charges executed by the Prussian Guard Dragoons, a series of movements occurred which brought seven regiments, or parts of regiments, into one long line, which immediately attacked a corresponding long line of French cavalry. Five thousand men were speedily engaged in hand-to-hand fighting, enveloped in a tremendous cloud of dust. The impact was terrific, and the French cavalry were soon put to flight. Bonie tells us that the French light cavalry were knocked to pieces against the solid, impassible line formed by the German dragoons, and, in speaking of the fight, gives us some notion of how completely the

* "The French Cavalry in 1870,"—Colonel BONIE.

French had lost their presence of mind when they mistook their own lancers for uhlan's and cut them down.

As no separate losses are given for this charge, I extract those furnished by the regiments engaged. The losses represent the whole day of the battle and not this charge alone, though it is probable that the majority of the losses occurred here ;—

	Men.			Horses.		
	Killed	Wounded.	Missing.	Killed.	Wounded.	Missing.
2nd Dragoons of the Guard. *	15	95	11	105	45	0
13th Dragoons ...	5	80	8	12	35	18
19th " ...	14	102	9	0	0	95
4th Cuirassiers ...	12	33	3	50	0	6
13th Lancers ...	10	40	6	24	19	18
10th Hussars ...	3	26	4	10	13	15
16th Dragoons ...	4	18	3	17	6	20
	63	394	44	218	118	172
	Total—501.			Total—508.		

As I have previously said, it is difficult to exactly apportion from these losses what share should fall to this charge. I think we might safely say two-thirds. It will be observed how closely the loss of men and horses

* One squadron of this regiment lost 70 horses in one of the isolated combats early in the battle, in charging the retiring battalions of two French brigades.

corresponds.* The regimental losses are interesting, especially those of the 19th Dragoons.

It has been said that the *mêlée* lasted half-an-hour. It is important to note that the Prussian cavalry had been in the saddle since 2 A.M., and had neither watered nor fed the whole day.

Here are the losses for the battle of Mars-la-Tour for the three cavalry divisions present, exclusive of the cavalry operating with infantry which are included in the first table given :—

	Men.	Horses.	Strength.
Guard Cavalry Division ...	217 (18 p. c.)	354 (29 p. c.)	1,202
5th " " ...	852 (17 ")	819 (16 ")	5,029
6th " " ...	275 (9½ ")	313 (10·8 ")	2,883
	<hr/> 1,344 <hr/>	<hr/> 1,486 <hr/>	<hr/> 9,114 <hr/>

From this it will be seen that there is a fairly close parallel between the loss of men and horses in cavalry. Turning now to artillery we find no such parallel. The total loss of artillerymen was 728, whilst that of the horses was 1,015; and even this difference is not as great as might be expected, nor so large as occurred at Gravelotte, Sedan, and several minor engagements.

Respecting the loss of men and horses a curious coincidence occurred in this battle in 2 batteries of artillery.

* In the "Revue de Cavalerie," April, 1887, the loss of men and horses amongst the Germans in the "Grand Mêlée" is quoted at 498 and 479 respectively, which compares very well with the table we have quoted. I think it is certain that the exact losses in the *mêlée* are not known.

	Men.			Horses.		
	Kill- ed.	Wound- ed.	Miss- ing.	Kill- ed.	Wound- ed.	Miss- ing.
1st F. Div. 10th F. Art. Regt.	13	31	0	31	9	0
2nd Ditto ..	13	31	0	32	11	0

The number of men and horses hit was nearly identical in each division, and had it been an experiment carefully performed, closer results could hardly have been obtained.

BATTLE OF GRAVELOTTE.

Men.			Horses.		
<i>Artillery Losses.</i>					
Killed.	Wounded.	Missing.	Killed.	Wounded.	Missing.
171	764	10	931	344	2
Total—945.			Total—1,277.		

The totals here are made up of actual killed and wounded, and not, as is so often in cavalry losses, with "missing." Again, we notice the great difference between the loss of men and horses.

In this latter respect the most notable artillery losses in this battle were:—

	Men.		Horses.	
	Kill- ed.	Wound- ed.	Kill- ed.	Wound- ed.
1st F. D., 9th F. Art. Regt. ...	23	92	183	31
2nd F. D., 2nd H. A. Batt. 9th Art. Regt.	43	140	259	42
	66	232	442	73
	Total—298.		Total—515.	

Cavalry Losses.

Men.			Horses.		
Killed.	Wounded.	Missing.	Killed.	Wounded.	Missing.
30	132	2	99	155	28
Total—164.			Total—282.		

BATTLE OF BEAUMONT.

Artillery Losses.

Men.			Horses.		
Killed.	Wounded.	Missing.	Killed.	Wounded.	Missing.
21	136	2	78	117	0
Total—159.			Total—195.		

Cavalry Losses.

3	10	0	16	11	2
Total—13.			Total—29.		

BATTLE OF SEDAN.

Artillery Losses.

Men.			Horses.		
Killed.	Wounded.	Missing.	Killed.	Wounded.	Missing.
46	301	0	346	288	3
Total—347.			Total—637.		

Cavalry Losses.

25	99	20	101	83	19
Total—144.			Total—203.		

The most notable of the German losses at this battle were the following:—

	Men.			Horses.		
	Kill- ed.	Wound- ed.	Miss- ing.	Kill- ed.	Wound- ed.	Miss- ing.
3rd H. A. Div., 11th F.A. Regt.	9	52	0	105	39	0
	Total—61.			Total—144.		
Guard Cav. Div. ..	9	51	0	54	62	0
	Total—60.			Total—116.		

The cavalry charges executed at Sedan were principally French. It is melancholy to read of the useless manner in which this devoted branch was sacrificed. The only knowledge we have of their losses is on the testimony of Bonie, who states that on an average each regiment lost 250 horses, which we may take roughly at 50 per cent.

Later, in speaking of a charge executed by the 4th French Lancers, which were endeavouring to support the Chasseurs d'Afrique, we are told that the regiment lost two-thirds of their men and horses. One squadron of the 1st Regiment of French Cuirassiers, in endeavouring to cut their way through the Prussians, lost three-fourths of their number.

I do not propose dealing any further with the losses in the Franco-German War, excepting to draw attention to those suffered at the battle of Bapaume by the 8th Prussian Cuirassiers and a battery of field artillery.

Two squadrons of the 8th Cuirassiers charged a body of French infantry formed in square. The cavalry received the fire at close quarters. Their losses were:—

Men.			Horses.		
Killed.	Wounded.	Missing.	Killed.	Wounded.	Missing.
17	9	5	52	19	2
Total—31.			Total—73.		

The loss of horses is here out of all proportion to the men; the French evidently fired at the horses. The loss of the men was about 10 per cent., whilst that of the horses was 24 per cent. The percentage of hits is remarkably low, considering that the range was very short.

In the same battle a battery of Prussian artillery lost 41 men and 97 horses; a second battery lost 18 men and 36 horses. The guns could not have been removed from the field, but for the aid of the infantry. The loss was due entirely to the French artillery fire. In both these cases the loss of horses was double that of men.

Summary of Losses under Fire.

Reviewing these losses from Weissenburg to Sedan, we learn that under fire, for every 100 casualties amongst cavalymen there will be 120 amongst the horses, and for every 100 artillerymen disabled there will be 142 horses.

Taking the losses of horses and men from the battle of Aghrim in 1691 down to Sedan in 1870 and dividing

the 179 years into certain periods, we have the following results :—

1691—1799 : For every 100 cavalrymen disabled there were 148 horses.

1800—1865 : For every 100 cavalrymen disabled there were 121 horses.

Ditto : For every 100 artillerymen disabled there were 133 horses.

1866—1870 : For every 100 cavalrymen disabled there were 141 horses.

Ditto : For every 100 artillerymen disabled there were 133 horses.

It is curious that in the first period the loss of horses should have been so large ; in fact, not since equalled, though, in this respect, the third period runs it very close. The third period appears to disprove the theory we had formed of the close connection between the loss of horses and men in recent wars in the cavalry arm ; but the undue proportion mentioned above is due to the enormous Austrian cavalry losses in 1866 ; such a disproportion did not exist on the Prussian side, nor did it exist at Custoza. We are compelled to assume that the influence of the breech-loader and the disasters of a retreat, swelled the Austrian losses to the enormous numbers we have given. Omitting the Austrian losses from our third period, we find that in 1866—1870, for every 100 cavalrymen disabled there were 113 horses ; and this we may adopt as approximate to the truth of the losses which will occur to a victorious army. If the French losses for 1870 had been obtainable, it is probable that they would have dislocated our table as much as the Austrian losses have done ; and

that it would have been found necessary to divide the losses into two distinct groups, *viz.*, victors and vanquished.

It is singular to observe that the artillery losses in the second and third periods are identical. As I have not been able to obtain any Austrian artillery losses for the third period, the correctness of the table is not affected.

SECTION II.

OTHER SOURCES OF LOSS.

Hitherto we have only spoken of those losses to horses resulting from the fire of the enemy. It may at once be stated that this furnishes the least loss to which horses are exposed in war, whilst privation, forced marches, exhaustion, and disease furnish the largest. At times these factors may be operating at separate periods, but occasionally they may all be acting at one and the same period, and nowhere is this better seen than during retreats. We purpose, therefore, describing the results of these as influencing the loss of horses.

NAPOLÉON'S RETREAT FROM MOSCOW.

Napoleon crossed the Niemen in June, 1812, with 187,121 horses of cavalry, artillery, and train. It is difficult to arrive at the exact number of cavalry horses, for nearly all authors who have written on the campaign give a different number ; it was probably about 60,000.

Very shortly after he crossed the Niemen the weather changed. It had previously been very hot, it now poured with rain ; it is said to have rained continuously for five days and that the fall was quite unprecedented ; the result was that the weather became very cold, the roads were impassible, there was little or no food for men and horses, and it is said that from 5,000 to 10,000 died in a few days, occasioning the loss of 100 guns and 5,000 ammunition wagons. According to Chambray,* after crossing the Niemen, there were found on the road to Wilna the bodies of 10,000 horses.

It is impossible to believe that this mortality was due to the weather ; there was doubtless other causes in operation. We are told that at this time the only food for this vast host of horses was the young growing crops, green rye, barley and wheat, and there can be no doubt in my mind that much of the trouble produced was caused by this food-producing intestinal disturbance. Three years later, about the same time of the year, similar trouble occurred to ourselves, though on a much smaller scale during the retreat from Quatre Bras on Waterloo ; some of the cavalry horses were fed on growing wheat, and they died in a few hours in great agony. This has been left on record by the veterinary officer who had charge of the cases.†

Napoleon always put down the loss of his horses during the retreat to the intense cold ; but we have the clearest possible evidence that his cavalry had practically disappeared before the frost set in. His losses

* "Histoire de l'Expédition de Russie."

† Percivall's "Hippopathology."

at Borodino are not given, but it is said that the greater part of the dragoons perished at this battle; and we are told that so effective was the Russian artillery fire, that of 12 squadrons of a Westphalian Brigade only 300 horses were mustered on the evening of the battle. Murat stated that half the cavalry perished in the partisan warfare around Moscow in their search for supplies. On leaving Moscow it was evident that neither gun nor cavalry horses would last very long; they were then practically on the verge of starvation.

The first fall of snow occurred on the 6th of November, and by this time 247,000 men and 92,000 horses had succumbed, and on this date Berthier wrote to Victor, at Napoleon's dictation, and reported that the cavalry was already unhorsed; before this the greater part of the artillery and train had been abandoned. With the snow came intense cold, the thermometer fell 18° below freezing point, and Napoleon in his correspondence says, that his horses perished not by hundreds but by thousands. Alison tells us that the Emperor expressed the same views to the Abbé de Pradt, "So also in Russia could I prevent it from freezing? They came and told me every morning that I had lost 10,000 horses during the night. Well, a good journey to them. Our Norman horses are less hardy than the Russian; they cannot resist more than 9° of cold."

Three days after the passage of the Beresina, on 13th December, the *debris* of the Grand Army recrossed the Niemen, 7,000 infantry and 1,600 cavalry. The army had disappeared in six months.

There is ample evidence that the cold had nothing to do with Napoleon's disaster: it aggravated it, no doubt, but it did not kill his horses—starvation effected that. It cannot be too distinctly stated that if horses are fed and looked after they can withstand extremes of heat and cold, rain and sun, with almost absolute impunity.

During the retreat the horses of the artillery of the Young Guard suffered less than the other artillery horses; but this was due to the fact that during the three days they were left at the Kremlin, after the departure of the army, they found and appropriated a very large quantity of oats which they brought back with them.

I have dwelt on this subject for the reason that the excuse offered by Napoleon for the annihilation of his cavalry, was 42 years later offered by ourselves. In neither case is there a shred of evidence that the cold had any serious influence in the matter.

Retreat on Corunna.

In this retreat—carried out in cold, rain, ice, and snow, over the worst of mountain roads—the chief failing which contributed to the losses was the shoeing. The food-supply was not abundant, but apparently sufficient. In the diary of an artillery officer who was present during the retreat, he only mentions two days on which his battery was without food and rations; *

* "From Corunna to Sebastopol."

though in a diary from the pen of another artillery officer, Captain Wall, who went through the retreat,* he does mention short rations for the horses, but lays especial stress on the absence of shoes and nails ; in fact, all authorities concur in blaming the want of shoeing as the chief cause of evil. The army had but few shoes and nails ; iron was plentiful in the country, but there was no time for making shoes ; mountains, rivers, and ravines had to be crossed ; the troops bivouacked in the snow several nights in the mountains ; it rained and froze as it fell ; baggage animals, artillery, and cavalry horses foundered, and were shot to prevent them falling into the hands of the enemy. The feet of the men failed as well as the horses ; wagons were left behind, ammunition blown up, and treasure thrown away. When the horses entered Lugo many of them fell dead in the streets, others were shot, and over 400 carcasses were lying in the streets bursting, putrefying, and poisoning the atmosphere. †

Wall tells us that on 31st December his battery marched 34 miles through deep snow over the mountains, without halting a minute, and that for 145 miles not an hour's halt was made during any day, and merely resting a few hours at night. He says, his horses suffered considerably in their shoulders from the collars being badly made.

On arriving at Corunna what remained of the cavalry horses was destroyed to prevent them falling into the hands of the enemy, owing to their being no room on

* "Proc. R. A. Institute," Vol. XIV.

† Southey, "History of the Peninsular War."

the transports. The destruction of the cavalry created a painful impression, and intensified the horrors of the retreat. The horses were destroyed on the beach, and it is said, that many of those awaiting their turn became panic-stricken and broke away.

This was not the first time we had destroyed horses to prevent them falling into the hands of the enemy. The 11th Dragoons before leaving Holland in 1799 destroyed 152 horses on the beach before embarking, owing to want of transport.

The losses on this retreat have been put at 5,000 animals.

The 7th Hussars landed at Corunna with 680 horses ; two months later, when they returned, only 250 remained.

The 10th Hussars landed with 700 horses and returned with 340.

The 15th Hussars landed with 640 horses and returned with 400.

The 18th Hussars landed with no record of horses and returned with no record.

The 5th K.G.L. landed with 470 * horses and returned with 290.

During the retreat 17 men of the 10th Hussars died, whilst 60 horses of this regiment died or were destroyed from exhaustion.

A troop of horse artillery lost 15 men and 115 horses.

* The exact number is not quoted ; after deducting the deaths at sea and the sick and lame on landing, this is what remained.

I cannot ascertain what the other losses were, but it is safe to assume that the cavalry lost about 50 per cent. of their horses, and that four or five horses died to one man. The average daily marching was 15 miles.

In the letters of General Sir A. S. Fraser, R.A., he mentions that the Corunna campaign cost the cavalry 4,000 horses and 1,100 men out of 7,000 of each, which makes the cavalry loss in horses 57 per cent., and in men 15·7 per cent.; but this strength in cavalry cannot be correct; there were only five regiments present. Beamish * puts the strength of the cavalry at 2,278.

Wellington's Retreat from Salamanca.

Wellington retreated from Salamanca to Ciudad Rodrigo with troops and horses verging on starvation. The distance was 240 miles; the weather dreadful, owing to incessant rain; rivers, stony and ploughed lands, and swamps had to be crossed. No food for the horses, excepting the bark of trees and sprigs of wild briar; on one day's march the ground was so heavy that the horses sank over their fetlocks. The loss of horses was 280, or more than one for every mile traversed.

Starvation.

Our difficulty is not in finding examples of the loss caused to armies in the field from starvation or insufficient food, but rather to find any big campaign where this has not occurred. Napoleon's troubles in Russia, and Wellington's complications in Spain, were all attended and even induced by insufficient food for both men and horses.

* "History of the King's German Legion."

There is nothing which tells so early on animals as short and insufficient rations ; in this respect they show starvation much earlier than men ; and, further, they take longer to recover. There are physiological reasons why this should be so into which we cannot enter, but there are also psychological explanations. Murat complained to Nansouty during the 1812 campaign that the cavalry charges were not executed with vigour. The latter replied, "The horses have no patriotism ; the soldiers fight without bread, but the horses insist on oats," There is more in this than lies on the surface.

In the Peninsula hundreds of horses died from starvation. Writing in August, 1809, the Duke said that the daily and increasing loss of horses from deficiency of food, and from the badness of what there was, was really alarming. The horses had not received three regular supplies of barley for 28 days. In 1812, before Ciudad Rodrigo the cavalry regiments lost heavily from starvation. It was due to the loss of horses from starvation, and the exhausted condition of those living, which, with other causes, determined Wellington retreating from Salamanca.

An army may be starved in an enemy's country even when no actual fighting is occurring. The army of the Indus which entered Afghanistan in 1838 affords a good example of this. On their way to Kandahar *via* the Bolan, the force was starved. No food and but little water was to be had for them, and the animals, especially horses, melted away. Sometimes they would get no food for days. The cavalry loss was from 40 per cent. to 60 per cent. in the 13 months occupied by the

expedition, whilst 3 elephants, 30,000 camels, 264* ponies, and 623 bullocks died. Practically, none of this loss was due to the enemy, but wholly to exhaustion and starvation.

The most melancholy example of the starvation of an army occurred in the Crimea. It is singular to observe, in reading the evidence taken by the Chelsea Commissioners, how they dwell on exposure as the cause of the disappearance of the cavalry. Experts who were sent to make their enquiries on the spot were of opinion that stables or shelter of some kind would have saved the brigades. In fact, we made the same absurd excuses which Napoleon made in 1812.

We starved our horses to death—of that there can be no doubt. Animals do not start on each other's manes and tails until compelled by dire necessity; nor do they eat the spokes of wheels and the bottoms out of carriages if they can obtain a more satisfactory source of supply. We landed a force and failed to feed them—starved the horses to death, and then blamed the commanders for not keeping them alive! I have no hesitation in saying that the winter had nothing to do with the death of these horses. They would have died just the same had it been summer, the only difference being that they would probably have taken a little longer over it.

Though a nation of horsemen, we have, apparently, got to learn that horses must be fed if they are to be kept alive—as Nansouty said, they cannot live nor fight on patriotism—a pound or two of hay or a handful of grain every third day can only have one termination.

* We managed to double this number in the last Afghan War.

Here are our Crimean losses (cavalry and artillery) for the six months ending 31st March, 1855:—

Cavalry.

	Heavy Brigade.	Light Brigade.
Number alive on the 1st October, 1854 ..	930	1,087
Joined since	125	74
	<hr/> 1,055	<hr/> 1,161
Killed in action or destroyed for wounds..	73	353
Transferred to other corps	10	136
Died or destroyed in consequence of disease	493	439
	<hr/>	<hr/>
Remaining alive on 1st April, 1855 ..	479	233

During the six months under observation the loss of the Heavy Brigade from sickness alone (starvation) was 47 per cent., and of the Light Brigade 38 per cent.

Artillery.

Number of horses alive on 1st October ..	2,081
Since joined	751
	<hr/> 2,832
Killed in action or destroyed for wounds ..	96
Died or destroyed in consequence of disease ..	1,190
	<hr/>
Remaining alive on 1st April, 1855 ..	1,546

During the six months the artillery loss from disease alone (starvation) amounted to 42 per cent.

*The total loss of Artillery and Cavalry Horses for
the six months ending 31st March, 1855:—*

Strength on 1st October, 1854	..	..	5,048
Killed in action or destroyed for wounds	..	..	522
Died or destroyed for disease (starvation)	..	..	2,122
Remaining on 1st April, 1855	..	..	<u>2,256</u>

Out of 2,329 transport horses and mules landed in the Crimea during the six months mentioned above, 200 were destroyed or died from sickness, whilst 689 "died from severity of the weather, fatigue, and exposure." I have quoted the official designation of this loss. For "severity of the weather" read "starvation."

The transport loss was 38 per cent.

Reverting again to the cavalry losses, Lord Lucan put them down to the fact that the cavalry was employed on transport duties, and he stated that between 12th December, 1854, and 17th January, 1855, no less than 426 horses of the division had died. The largest loss on any single day was the 6th January, when no less than 43 horses died.

It is certain that the mere fact of employing cavalry horses to bring up ammunition to the front would not kill them had they been fed, and they might just as well have been employed on some useful duty as standing idle at their pickets. But work, in such weather and with such roads, cannot be performed on a couple of pounds of barley and a mouthful of hay!

General Foy said that three-fourths of the horses in France were frozen to death in Russia ; we may certainly say that more than half the horses which landed in the Crimea never returned. Even at this distant time a perusal of the tables I have given, produces a feeling of mortification.

Defective Shoeing.

Defective shoeing as a cause of inefficiency is probably present in every campaign to a greater or less extent. By the term defective shoeing, I mean everything in the form of shoeing which can possibly fail. There may be both shoes and nails in abundance, and yet, owing to the fact that military operations are being carried out with great rapidity, no time is left for the shoeing of the horses, and inefficiency results. In the Austrian campaign of 1866 the German cavalry pressed the enemy so closely, that the horses could not be shod, and the lameness and other inefficiency which resulted from this was most serious. General Hartmann's cavalry division had marched 16 miles to the battle of Koeniggratz, it was ten hours engaged with the enemy, and in pursuing the retreating Austrians marched 97 miles without a break in three days ; although the sick and lame had been left behind, yet each regiment by this time had 150 horses unfit for service, and one-third the horses of the Landwehr Brigade were lame. All this was due to the severe work and the impossibility of keeping the horses shod.

Sir John Moore's campaign is the best example of the damage which arises to the feet from want of proper

precaution and from defective shoeing. The 7th, 10th and 15th Hussars were landed at Corunna after being at sea about three weeks, and a few days after disembarking they marched up the country by squadrons in daily succession, occasioning the last squadron to be later in its march by nine days than the first. In the 1st squadron 20 cases of fever in the feet occurred, and the horses were left behind, and such continued to be the case more or less all along the line of march. Still the first suffered much more than the last—a circumstance which induced Mr. Castley, Veterinary Surgeon to the 15th Hussars—who records the case*—to consider that the immediate exertion to which the horses were put after standing so long on shipboard was the cause of the trouble. We now know that had these horses been exercised for a few days the cases would not have occurred.

In the Corunna campaign the shoeing broke down entirely. No shoes or nails were obtainable, the long and heavy marches wore the feet down to the quick, and this, coupled with the severe work, produced many cases of fever in the feet, or founder. The 3rd German Hussars reached Corunna with 290 horses. Only half this number was effective, the rest were lame from defective shoeing or wounded. In no campaign was this condition so marked. Shoeing was always a trouble in the Peninsula. The farriers could not do the amount of work required, and Wellington recommended that shoes should be sent out from home ready made. There is very little new under the sun—this is our present system.

* The Campaign of Stuart's Cavalry."

In the Civil War in America the shoeing of the horses in both armies was in a deplorable condition, through being short of farriers and material. M'Clellan says, that it was no uncommon thing to see a soldier leading a limping horse, whilst from his saddle dangled the hoofs of a dead horse which he had cut off for the sake of their shoes.*

There is no branch of shoeing the "neglect" of which so suddenly paralyses the movements of an army as defective frost shoeing or "roughing." History furnishes many examples of this, the most notable of which occurred in Napoleon's campaign in Russia. General Wilson, in his "Narrative of Events during the Invasion of Russia," describes it as follows:—"On coming to the first enemy's bivouac on the morning of the 5th November, some cossacks accompanying the English General (Wilson) seeing a gun and several tumbrils at the bottom of a ravine with the horses lying on the ground, dismounted, and, taking up the feet of several, hallooed, ran, and kissed the English General's knees and horse, danced and made fantastic gestures like crazy men. When the delirium had somewhat subsided, they pointed to the horses' shoes, and said, 'God has made Napoleon forget that there was a winter in our country. In spite of Kutusow, the enemy's bones shall remain in Russia.' It was soon ascertained that all horses of the enemy's army were in the same improperly shod state, excepting those of the Polish Corps and the Emperor's own, which the Duke de Vicenza, with due foresight, had kept always rough-shod as is the usage of the Russians."

* Percival's. "Hippopathology."

Napoleon, during the retreat, was endeavouring to reorganize his army, now reduced to 5,000 cavalry. Arms were distributed, hand-mills to grind grain had recently been received from Paris: these were issued, and thrown away immediately afterwards as useless; but no frost nails were to be found amongst the stores, and that was the article most wanted for the efficiency of the artillery and cavalry.

It is not possible to say how far the possession of frost nails by the French Army at this critical period might have influenced the tide of European affairs.

During the retreat of the Danes in the Schleswig-Holstein campaign, 1865, a sudden frost set in the day this step was decided on. The roads were like glass, and not a horse in the whole army was rough-shod. The *Times'* correspondent, who was present, gives a very graphic account of the misery and wretchedness of this night's march, with a heavy snow falling, intensely cold and dark, every body dismounted leading his horse, whilst others were employed holding up the draught horses and dragging guns, ammunition wagons, etc., by hand. It took nine hours to do less than seven miles of marching, and the whole road was choked by dead and dying horses, broken ankles, guns, and wagons. The pursuers were, fortunately for the Danes, also unroughed.

In 1870-71 the army of Bourbaki suffered severely during its winter retreat from the absence of any means of roughing, whilst the Germans, profiting by their 1865 experience, were able to move, as a French

officer expressed it, "with no more difficulty than on the finest roads." *The Germans, in their official account, are rather silent on the subject, but I gather that they had a little more difficulty in the matter than the French officer represents. Hozier, in his "Franco-German War," specially alludes to the uselessness of the German cavalry in the actions preceding the capture of Le Mans, owing to the slippery state of the roads. A strange sight was presented by the army as it struggled over the icy road; even the Prince had to dismount and walk; most of the staff and cavalry escort were also dismounted; others, mounted, forced their horses to struggle on in the ditch by the side of the road. The horses of the artillery and train were falling every instant, and ice nails became worth nearly their weight in gold.

Sore Backs.

Perhaps as a cause of inefficiency, especially of cavalry horses, sore backs will take precedence of all other causes. Probably every army which has taken the field since saddles were introduced has suffered more or less from this evil; to an extent it is inseparable from military operations, yet we are bound to recognise the undoubted fact that sore backs occur in very much larger numbers than they should, and, further, that with great care and an improved type of saddle they are capable of considerable reduction.

It is not my intention to point out the causes leading to the production of sore backs, further than to any that there are several factors at work in the matter, of

* "Revue Vétérinaire," October, 1876.

which the weight carried loss of condition, and a defective type of saddle are the most prominent.

It is very strange that, in spite of the frequency of sore backs on service, little, if anything, has been written about it; it is only by an incidental remark made here and there by authors and historians that we can be positive the evils which affect us in the present day affected our forefathers; but there is no reason why the literature of campaigns from Waterloo downwards should preserve such an absolute silence on this important question. The Germans, who do everything in a very thorough manner, make no mention in their official accounts of the sore backs their cavalry suffered from in 1866 and 1870, and yet we know the first campaign especially, though it only lasted for a few weeks, was long enough to produce a considerable amount of inefficiency in this direction.

The magnificent appearance of the force which crossed the Niemen in 1812 was to a great extent deceitful. The marches they had made up to the Russian frontier had been prolific of many causes of inefficiency amongst the cavalry, and especially in the production of sore backs. Unger * states that more than half of the cavalry had sore backs, whilst Mitchell † speaks of the many sore backs which were actually rotting under the saddle, "for the French trooper has little affection for his steed, pays little attention to the animal, and still less to his saddling and appointments." In my experience the French trooper is by no means singular in his neglect of his horse.

* "Exploits et Vicissitudes de la Cavalerie."

† "The Fall of Napoleon."

Wilson* tells us that the horses captured by the Russians from the French in 1812 were perfectly useless, owing to their sore backs, and low general condition. We have thus ample evidence that the Grand Army, in spite of its experience of war, was just as liable to the scourge of cavalry as ourselves.

Nothing is to be derived from our "Peninsular" histories of the amount of inefficiency resulting from sore backs; it is only through the medium of professional papers † that we are briefly told of the amount of suffering inflicted and the condition of the backs in this campaign.

Of the Waterloo campaign, short as it was, we have the undoubted evidence of Mercer, ‡ who says, "for with all our care we have a number of galled backs and shoulders, though in this respect we are not half so bad as the cavalry, amongst whole squadrons of whom there is scarcely a sound horse."

In the Eastern campaign of 1854-55 our cavalry had little else to do both before and after Balaclava than to submit quietly to be starved to death. Before they left Turkey for the Crimea a reconnaissance was made by Lord Cardigan towards the Danube, at the angle of the Dobrudscha; the strength of the force was about 300; before they had marched 30 miles several horses were sent in lame and otherwise disabled. The force was away 17 days, and they marched in, according to Calthorpe, § with 90 sore backs out of 280 horses. Russell

* *Op. cit.*

† Percivall's "Hippopathology."

‡ "Journal of the Waterloo Campaign."

§ "Letters from Head-quarters."

who very properly speaks of it as the "Sore Back Reconnaissance," says about 100 out of 280 horses were disabled.* Until the publication of the Annual Reports of the Veterinary Department this was the only record in existence, so far as I am aware, which conveyed with exactitude any notion of the amount of inefficiency which is capable of being produced by sore backs.

A note on "Russian Remounts" appeared in the "Bulletin de la Réunion," from the pen of a Russian Cavalry officer serving in the Balkan Campaign, 1877.† He mentions that the 8th Russian Hussars marched 384 miles in 16 days, or less than 22 miles a day; of four squadrons two had their feet all to pieces; the other two were terribly pulled down, and in the fourth there were 26 sore backs. The 8th Cossacks were in the same brigade. They had nearly 35 per cent. of their horses on the sick list, and if they had marched seven days more, it was calculated that half the regiment would have been on foot. After the cavalry reached Bulgaria each regiment could only parade a single squadron with difficulty, and those horses not sick were in a "dreadful state."

The conditions which have existed in the past exist with us to-day, and will exist so long as we make one horse carry in weight the equivalent of two men.

Heel-rope Galls.

Heel-rope galls—incorrectly so termed—are at times a very serious source of inefficiency. I mention them

* "Army and Navy Gazette," March 11th, 1893.

† "Proc. R.A. Institute, Vol. XII, Captain Roche, R.A.

here, as they are absolutely preventable, and with care such a thing should be unknown. It is generally supposed that a heel gall or head-rope, gall—properly so called—is produced by the heel-rope, but such a thing is unknown; heel galls are produced by the *head-ropes*, and they can only occur under one condition, *viz.*, leaving the head-rope so long that the horse gets his leg over it; in this position one hind leg gets caught up, and the horse—whose intelligence is only to be met with in books—saws his leg up and down the rope until he has produced sufficient damage in three minutes to take eight weeks to repair. With head-ropes 3 feet 6 inches to 4 feet long, heel galls are an impossibility. Such injuries should never figure in our returns; they are the best example of preventable injuries.

Exhaustion.

This is a very comprehensive term, signifying an inability on the part of the horse to work as a result of one or more causes.

We have spoken of starvation, and we all know that if horses are not fed they cannot be worked; but we have now to learn that even if fed they cannot be worked beyond their strength; in other words, an unlimited supply of food will not produce an unlimited amount of work; the human and animal organism is only capable of producing with useful effect a certain amount of daily work, but this quantity has, of necessity, to be neglected where important military operations are concerned, and where great events may depend upon the men reaching a certain point, even should their horses afterwards die as the result. I take it, however, that this condition is not of every-day occurrence in

warfare, and, on the principle that dismounted cavalry are no longer formidable, it is evident that every care should be taken to save the horse as far as possible and husband his strength; this is exactly what the British cavalryman, when away from the eye of his officer, makes no attempt to do. Field-Marshal Sir J. Burgoyne * says, that in the Peninsula it was most noticeable the difference in the care bestowed on the horses by the British and German dragoons; the horses of each force lived on the same forage and were of the same breed, so that the only possible difference to account for the marked difference in condition and fitness for work was the care bestowed by the men; and he tells us so marked was this distinction between our cavalry and that of the Legion, that the latter could put 100 horses in the ranks to our 10!

Mercer, in his "Diary of the Waterloo Campaign," draws a contrast between the German and British dragoon, and he says, that affection for and care of his horse is the great distinction between the two. "The former," he says, "would sell everything to feed his horse; the latter would sell his horse itself for spirits or the means of obtaining them. The one never thinks of himself until his horse is provided for; the other looks upon the animal as a curse and a source of perpetual drudgery to himself. . . . In the Peninsula the only means of enforcing some attention to their horses among our English regiments was to make every man walk and carry his saddle-bags whose horse died or was ill."

These side lights on the Peninsula mortality are very instructive. I wish I could feel that there was

* "Military Opinions."

no cause for apprehension in the future in the direction we have mentioned. I yield to no one in my appreciation of the British dragoon as an individual, and with a limited experience of foreign cavalry, I do not consider from what I have seen that the two can be placed in the same class; but a more careless or thoughtless man with horses it is difficult to imagine.

History teems with examples of rapid movements of armies and units, some of the marching and distances covered being extraordinary; but it is essential to remember that the movements are very costly in horse-flesh: and further, that there is probably no animal which succumbs sooner to exhaustion than the horse. There are several reasons for this: his body reserve is comparatively small owing to his daily requirements being so large; further, in rapid and forced movements little or no time is allowed for feeding. It does not appear to strike the ordinary mind that horses require a certain number of hours' idleness for feeding purposes alone. It takes a good feeder 10 to 15 minutes to eat 2lbs. of oats, and it takes one hour to eat 4lbs. of hay. It is safe to say that a horse spends $4\frac{1}{2}$ hours out of every 24 doing nothing but feeding; and this is the least amount which should, under ordinary circumstances, be allowed him. But military necessities know no law, and if the horses had the food to eat, in many cases no time could be allowed them to consume it. Take the case of General Hartmann's division in the war of 1866, quoted on page 300. It is pretty safe to say that when prolonged exertion of this kind is demanded, 25 per cent. of the horses will be laid up in three or four days.

If troops in a state of exhaustion have to come into action, their effective is materially reduced. At Boro-dino the French cavalry, towards the end of the day, charged at a slow trot. No other pace could be got out of them owing to their state of previous exhaustion.

Wellington bitterly complained of the manner in which the horses, both cavalry and artillery, fell to pieces in the Peninsula; he urged that no horse should be sent on service under six years of age; further, he stipulated that very old ones should not be sent, remarking that he had known a remount of old horses killed by one day's work. The harassing work performed by the cavalry not only produced great mortality, but the horses fell into a state of extreme exhaustion. In one of his despatches he says, "It is inconceivable how fast the horses of both the cavalry and artillery fell away. When horses as well as men are new to war, I believe the former are generally the sacrifice of their mutual inexperience."

It is not our intention to give examples of the exploits of cavalry in distance marches under trying conditions; but we cannot refrain from noticing two marches which, though not of very great length, are still associated with military operations of great importance.

In 1866 Bredow's 5th Cuirassiers marched 200 miles in seven consecutive days, bivouacking daily, often in heavy rain; they came up with the enemy at Tobitschau with the results known.

The 1st Prussian Dragoons of the Guard left their bivouac at Beaumont at 4-30 A.M. and marched to

Mars-la-Tour, which they reached at 1-30 P.M., a distance of 35 miles. At 5-30, the same afternoon, they executed that memorable charge which nearly cost the regiment its existence.

There can be no doubt that, considering the active share in the operations which the cavalry had taken up to Mars-la-Tour, that they must have been in a very effective condition to have executed this brilliant charge after a long march.

The loss in draught horses from exhaustion is generally very severe; rapid movements of artillery or prolonged draught on heavy roads are most destructive.

At the commencement of the siege of Plevna there were 66,000 draught horses used for supplies, ammunition, etc., from Sistova to Plevna. At the end of the siege there were 44,000 left, no less than 22,000 had succumbed. These animals were killed by over exertion and mud, and do not include those killed in action.*

Loss in Transport by Sea.

We have dealt with the chief sources of loss of horses on service, but cannot refrain from mentioning one cause not associated with active service in the field, but with their transport by sea to the base of operations.

The loss on board a ship is often a very serious matter. The horse, physiologically speaking, was never intended as a sailor; he cannot vomit, and in consequence suffers from certain disorders of the brain from which he

* Irving Mantagu, "Wanderings of a War Artist," "Illustrated Naval and Military Magazine."

would otherwise escape; further, he has of necessity to be confined within a very narrow space in the horse-stalls, and where these are situated low down in the vessel, or, as is not uncommon, close to the engines, he suffers from the heat and the vicious atmosphere produced by defective ventilation. Under favourable circumstances the losses arising from these sources are not extremely heavy. The chief and serious loss is due to the horse fittings giving way during bad weather, and the living and panic-stricken freight being tossed from side to side and their lives battered out of them. In this way many of the horses are killed or so damaged as to necessitate destruction.

During the Peninsular War the loss of horses on board a ship was by no means heavy. The Duke in his despatches particularly mentions this, and looked upon the risk as trifling, though the voyage to Portugal occupied about the same length of time as a voyage to India in the present day. I can only attribute this comparative immunity to better and more substantial horse fittings. The following losses appear to have been exceptional, and due to a very prolonged stay on board a ship. The 3rd Hussars of the King's German Legion landed their horses in Portugal after being 17 weeks on board a ship. Forty horses died or were destroyed for glanders, and when the regiment was mustered on shore, scarcely half of its original number was fit to take the field; 145 men and 125 horses were left behind—the men from dysentery, the horses from fever in the feet caused by standing so long on shipboard.*

* "History of the King's German Legion."

In the Crimean campaign the losses were extremely heavy. Russell speaks of the inefficient condition of the artillery at Scutari, owing to the loss of horses on the passage. The 1st division of artillery lost on the voyage 27 horses out of 340, or nearly 8 per cent., which is exceedingly high. Colonel York, Commanding the Royal Dragoons, stated, in a letter to the *Times*, that the Royals lost 175 horses at sea between Varna and Balaclava. A corporal of dragoons (no regiment mentioned) stated in a letter that the "Wilson Kennedy" in the journey from Varna across the Black Sea was caught in a gale of wind, the horse fittings gave way, all the horses were thrown over to one side of the ship, and in one night more than 100 of them kicked and worried each other to death, and for two days and nights the troops were battered down with the dead and dying horses. Only eleven were saved on this ship, and on the third day 101 were thrown overboard.*

In the evidence taken by the Chelsea Commissioners, Lord Lucan, in dealing with the losses of horses at sea, said that the Heavy Brigade lost 226 troop horses on the passage from Varna to Balaclava, and that some of the officers lost all their private horses. The Brigade landed in such a condition from bad forage at Varna and a bad sea passage, that Lord Lucan says he could scarcely have recognised them.

Losses due to the physiological construction of the horse cannot be averted, but losses due to suffocation, poisonous atmosphere, and fittings giving way are clearly within the bounds of prevention.

* "British Battles by Sea and Land."

In June, 1802, a troop of the 8th Hussars took 150 Arab horses from Egypt to India ; only 51 were landed at Madras, the others died on the passage ; the mortality, it is said, being due to the weather.

In the expedition to South Carolina, a detachment of the 17th Lancers lost nearly all their horses at sea, due to bad weather.

Bad weather we cannot help nor prevent, but the horse fittings of a ship have no more right to give way than the bottom of the ship has to fall out.

Stampedes.

A great deal has been written about the intelligence of horses ; but I cannot help but think that his faculty of intelligence has been greatly overrated. That he has a good memory is undeniable, but that he is blessed with any large amount of intelligence is not my experience.

It may be said that the fact of his being liable to panic is no proof of his want of intelligence, as panics are not unknown to the higher animal man ; this, in a measure, is true, but the causes which give rise to stampedes are often so trivial, that if the horse had more intelligence they could not alarm him.

Stampedes are common associations of military service ; we suffered from them in the Peninsula, the French in Turkey, the Russians in the Crimea, and, later, in the Russo-Turkish War ; whenever, in fact, large bodies of horses are brought together in the open, this infectious nervous explosion is liable to occur.

The night before the battle of Salamanca a severe thunder-storm occurred, with very heavy rain; the cavalry horses were linked together. The 5th Dragoon Guards lost many of their horses; the 3rd Light Dragoons had one officer and 16 men severely injured by their linked horses running over them; the 4th Light Dragoons, on the other hand, lost no horses, owing to the fact that they were better linked. All that night, and the following morning until the battle began, from the general commanding the cavalry downwards, all were employed in endeavouring to secure the run-aways. Thirty-one horses were not recovered. Thunderstorms and heavy rains are a common cause of this disaster.

At Aranjuez the horses of the 13th Light Dragoons stampeded; they were unbridled and feeding, but linked together, and the men lying down. The 2nd German Hussars having been ordered to join Lord Wellington were filing past, the 13th sprang up and greeted their old comrades with a parting cheer, which so alarmed the horses that four troops stampeded; the horses strayed 4 or 5 leagues, but were all recovered.

I once knew a stampede to occur when a regiment was quietly watering at a large pond; it was probably produced by one horse pawing the water and splashing his companions; the effect was electrical, the whole troop went about, dashed into those behind them, and one-third of the regiment got away.

Loss from Disease.

It is not my attention, owing to lack of material, to attempt to deal with the loss of horses in the field from

disease; the losses are naturally very heavy, and in days gone by must have been alarming, but no complete statistics of any campaigns are available, excepting those which have occurred within the last few years, *viz.*, since the Afghan and South African Wars of 1879, and in these wars it has not been so much the loss of horses as the loss of transport animals which has been so heavy. I have not attempted to deal with the latter, it would require a paper in itself to do it justice.

From the Wellington despatches I have obtained two field states, one is dated 1st November, 1809, and shows the strength of the cavalry at 2,765, of which 12·6 per cent. are sick, and of the sick no less than 12 per cent. died. The artillery strength on the same date was 1,062, of which no less than 30 horses had died in one week.

On 9th January, 1813, the strength of the cavalry was 5,476 horses, of which 13 per cent. were sick. The returns for 1809 and 1813 are so close, that we may accept the percentage as probably representing the average sick in the Peninsula.

In the Crimea, on the 26th March, 1855, the sickness was 45 per cent., by the 3rd June it had fallen to 15·8 per cent.

We are probably not far from the truth in saying that we must reckon on having 12 per cent. of the horses always sick, which is about three times as many as during time of peace.

TOTAL LOSSES FROM ALL CAUSES.

The final question we have to consider is—what are our losses likely to be on a campaign?

It is obvious that in answering this question we are beset by many difficulties; we will therefore glance at some of the complete losses which have been experienced. The Army of the Indus in 1838 numbered 2,310 cavalry, horses and men; in 13 months they lost 1,146 horses and 185 men, or nearly seven times as many men as horses; of this loss, the 16th Lancers lost 86 men and 231 horses, including 10 men and 13 horses drowned crossing the Jhelum.

The Bombay Column of the Army of Invasion lost 418 horses out of 1,700, nearly 25 per cent.; whilst the loss of the Bengal Column was nearly 50 per cent.; these numbers include everything—deaths and castings.

In the Peninsula the following are the returns of deaths from all causes, so far as I have been able to ascertain them :—

4th Dragoon Guards	...	239 men.	445 horses.	
11th Dragoons ...	...	400 "	500 "	in 1 year.
13th " ...	...	274 "	1,009 "	" 4½ years.
14th " ...	...	654 "	1,564 "	" 5½ "
16th " ...	...	309 "	1,416 "	" 5 "
		<hr/>	<hr/>	
		1,876 "	4,934 "	"
		<hr/>	<hr/>	

Or a proportion of 263 horses to 100 men.

As the above regiments were not in the retreat on Corunna, no error arises by including these losses.

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The Prussian cavalry losses during the campaign in Bohemia in 1866, were as follows :—

Men.	Horses.	
1,330	Killed or destroyed for wounds..	873
Deaths from sickness	Missing	240
not included.	Died, exhaustion and disease ..	1,377
	Cast after the campaign ..	1,726
		<hr/> 4,226

If we take the strength of the Prussian cavalry at 25,000, their losses of horses from all causes for the campaign was nearly 17 per cent. We do not know how many men died from disease, probably very few, owing to the short duration of the war and the time of the year, making a small allowance for ordinary deaths, would give us a proportion of losses of 300 horses to 100 men, which is probably not far from the truth.

In the campaign of 1870, I can only obtain incomplete records for one regiment—the 4th Hussars. In the whole campaign they lost from all causes :—

Men.	Horses.	
31	Killed in action ...	24
Deaths from sickness	Wounded ...	42
not included.	Missing ...	5
	Died or destroyed for disease ...	6
		<hr/> 138

The loss in horses is equal to nearly one-fourth of their strength.

The official returns for the Franco-German War only show the loss of horses in action—killed, wounded, and missing—amounting to the astounding total of 14,595. No returns are given of those which died from disease, etc.; but as the army received a supply of 38,000 horses during the campaign, we may assume that the loss from disease was not less than 26,000. In this estimate I have assumed that one-half the wounded recovered in time to continue the campaign; only the wounded likely to recover are shown as such, the others being destroyed are included under the head of the killed.

If we take the mean strength of the German Army in horses to have been 222,000, the total loss for the campaign, on the assumption that the figures I have given for disease approach the truth, amounts to 17 per cent., which, strange to say, is exactly the percentage of their cavalry loss in the Austrian War of 1866.

I have no means of knowing what estimate exists at the War Office of our probable losses amongst horses in future campaigns, and what our requirements are likely to be in remounts; but a consideration of the data I have given shows that we must be prepared with a reserve of from 17 to 20 per cent. to meet all casualties.

The object I have had in view in bringing this subject forward is to direct attention to those losses which are more or less under our control. The very extent of the question has prevented me from dealing with the hundred and one points in the management, care, feeding, and watering of horses, which contribute not only to their condition but to warding off disease; it would appear almost puerile to tell a man that if his horse,

living in the open, and is being fed from a nose-bag with a hole in it, that a loss of condition results, or that if he only waters the animal the regulation three times a day when it needs it four times a day, that his horses will not be as fit as they should; but it is just this very attention to details which distinguishes the horse-master from the tyro, and which represents the difference between fitness and health, or loss of condition and disease.

Of all animals the horse is the one which soonest shows the result of neglect and ignorance, or of care and management. On none of these points have I had space to touch.

It may be considered that, in suggesting there is so much room for improvement in the care and management of horses in the field, I have not taken the trouble to inquire how we have handled these matters in recent campaigns, since our information has been so much more exact, and our training so much better. I have studied recent campaigns, and I see no improvement; as supporting this opinion, I will take the last campaign in which any numerous body of cavalry were engaged. I allude to the campaign of 1862.

We landed in Egypt 1,767 cavalry horses, and of these, in about three months no less than 352 had died, been destroyed, or killed in action, a loss of nearly one-fifth of the force; of the four-fifths remaining, the returns do not show how many were effective; but it is a well-known fact that one regiment had 213 horses on the sick list at one time with sore backs, heel-rope galls, and debility.

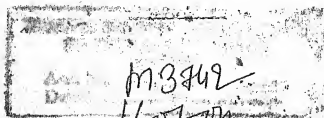
The total strength of horses for all branches of the Service landed in Egypt was 5,000, of these 2,567—or more than half—came under veterinary treatment, and 592 died or were destroyed, nearly one-eighth of the force; of those which died, the principal source of loss was exhaustion, 154; debility, 30; apoplexy, 11; fever, 114; gun-shot wounds, 22; killed in action, 53.

The total number of sore backs was 517, of which 2 died and 21 were destroyed! The total number of sore backs, harness galls, and heel-rope galls was 896!

One regiment landed in Egypt with 466 horses; in three months, from various causes, it had lost 114!

Finally, at Suakim in 1885, a regiment of cavalry, 200 strong, furnished *in one month* 68 sore backs, whilst a second regiment of the same strength furnished 23.

With these facts before us, there is sufficient evidence to show that there is considerable room for improvement in the reduction of the preventable loss of horses in war.





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